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AUTHOR Dyson, Sam A., Ed.

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ABSTRACT

A library-oriented, concentrated course in the use of computers in libraries is a definite need in the profession. Librarians can learn the use of computers even though they have no background in data processing. The profession is also in need of a course syllabus which can be used either in a formal college course or in an in-service training situation. One of the by-products of this institute will be such a syllabus. Pre-institute activities included a programmed instruction course to acquaint participants with terminology, theory, and logic of computers and to furnish all participants with a common store of background knowledge. Eight manufacturer's representatives presented their firm's hardware capabilities, library applications, cost and learning arrangements, and impending developments of interest to the library user. Fourteen papers on automating library technical processes, problems in library technical processes, systems analysis and flowcharting, and COBOL programming language are included. (Author)

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Planning and Implementing Academic Library Automation Programs

Proceedings of the Librarianship Training Institute
held at
Louisiana Tech University
June 14 - 28, 1970

Compiled and Edited by
Sam A. Dyson, Director

Conducted under a grant from the United States Office of Education, Title II-B Higher Education Act of 1965, P. L. 89-329, as amended.

Ruston, Louisiana
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LIBRARY AUTOMATION INSTITUTE

PROCEEDINGS

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LIBRARY AUTOMATION INSTITUTE

PROCEEDINGS

INTRODUCTION

On June 14 - 27, 1970 there was held a federally sponsored Training in Librarianship institute entitled "Planning and Implementing Academic Library Automation Programs". The site of the institute was the campus of Louisiana Tech University in Ruston, Louisiana. The institute was conducted under a grant from the United States Office of Education, Title II-B of the Higher Education Act of 1965, P. L. 89-329, as amended. The grant was in the amount of $20,273.00 and was directed by Sam A. Dyson, Director of Libraries at the University, with the cooperation of the University's College of Education.

Several reasons prompted the application to the federal government for funds to support this institute. Presently, if an academic librarian wants to take courses in computer science, he is obliged to take them as offered in schools of business or engineering. The courses are not oriented at all toward the bibliographic needs experienced in libraries. The examples, illustrations, problems, and terminology are all foreign to him, making the course more mysterious and difficult. Few librarians can afford to take off from their responsibilities for extended periods of time required of formal courses in computer science. A library-oriented, concentrated course in the use of computers in libraries is a definite need in the profession. Librarians can learn the use of computers even though they have had no background in data processing. This institute proved that beyond doubt. The profession is also in need of a course syllabus which can be used either in a formal college course or in an in-service training situation. One of the by-products of this institute will be such a syllabus.

One of the first steps necessary in the planning of this institute was to secure a well qualified faculty. Several criteria for selection to the faculty were used:

(1) They must have had experience in automating library processes.
(2) Background in both librarianship and computer science was highly desirable.
(3) They must want to participate in the institute after closely reading the formal application as submitted to the Office of Education.
(4) Each faculty member must have had teaching experience with the language selected by the faculty for use in the institute.
(5) One of the faculty members must have had thorough knowledge of the Louisiana Tech Computing Center.
(6) Each of four faculty members must have had working experience with automating processes in one of the following areas: (a) acquisitions, (b) cataloging, (c) circulation, and (d) serials.

The faculty members selected were as follows:

(1) For teaching the language: Mr. Roland Gatlin, Ph. D. candidate and CDP, Mississippi State University
(2) For teaching acquisitions automation: Mr. Bruce Alper, Library Systems Analyst, Florida Atlantic University
(3) For teaching cataloging automation: Mr. John P. Kennedy, Data Processing Librarian, Georgia Tech
(4) For teaching circulation automation: Mr. Gerry Guthrie, Director of Research and Development, Ohio State University Library
(5) For teaching serials automation, systems analysis, and flowcharting: Mr. Sam A. Dyson, Director of Libraries, Louisiana Tech University
(6) For Tech Computing Center knowledge, and teaching theory and terminology: Mr. A. G. McKee, Director of the Computing Center, Louisiana Tech University

The selection of the language to be taught during the institute was based upon two things: a questionnaire submitted to the faculty requesting they list languages in which they felt competent to teach, and a conference telephone call during which they made a final decision. The language chosen was COBOL. This choice turned out to be a fortunate one, since all of the computer configurations represented by the participant's institutions already possessed the COBOL compiler.

The next major consideration was the selection of the participants. The application submitted to the office of education required that twenty (20) be selected. The original application had the following geographic limitations: the State of Louisiana, East Texas, South Arkansas, and West Mississippi. One hundred eleven applications were received from all over the United States. Based upon this response, the geographic limitations previously intended were dropped. Preference was given to applicants from the State of Louisiana.

In order to be eligible, an applicant had to be employed in an academic library, a graduate professional librarian (implying a master's degree in librarianship), no previous experience or training in computer science, charged by their superiors with library automation responsibilities, and have access to a computer. There were only a few exceptions to the above qualifications, and so the qualifications seemed to be valid ones.

The selection committee was composed of the Director and Associate Director of the institute. A meeting was held in the Associate Director's office nine months before the institute was to begin, and twenty participants and fifteen alternates were chosen.

Of the twenty who were chosen, one had to drop out of the institute at the very last minute--the day before the participants were to arrive. His library director died very suddenly, and he was unable to come during that time of crisis for his institution. The hour being very late, the selection committee decided it was too late to get a replacement and the institute proceeded with nineteen participants from eleven states. Between the time that the selection was made and the beginning of the institute, seven of the fifteen alternates were eventually contacted. Participants in the institute are listed in the Appendix (See Appendix A).

In order to compile the class schedule, the Director mailed a tentative class schedule to each member of the faculty prior to the conference telephone call. During the telephone conversation, adjustments were made to the schedule. Several weeks before the institute was to begin, one of the faculty members, Bruce Alper, arranged, and the State of Florida financed, an addition to the schedule allowing Dr. William Axford, Director of the Florida Atlantic University Library, to come and meet with the participants and make a presentation on automating academic library budgets. Prior to that fortunate addition to our schedule, Mr. Alper volunteered to present the relatively new concept of Computer Output Microfilmers. This offer was enthusiastically accepted by the Director of the institute. Because of the wide interest in COM, the Director invited academic librarians and computer personnel from all over the State of Louisiana to attend this presentation. As the program worked out, Mr. Alper was helped in the presentation by Mr. John P. Kennedy and about twenty (20) visitors were present for this portion of the institute.

The final program schedule as it was executed is included in the Appendix of this publication (see Appendix B).

Pre-institute activities included a programmed instruction course, faculty meetings, and a "get acquainted" session Sunday night before the institute. The purpose of the programmed instruction course was to acquaint participants with terminology, theory, and logic of computers and to furnish all the participants with a common store of background knowledge. The text chosen was Science Research Associates' COMPUTER SYSTEMS FUNDAMENTALS in three volumes, published in Chicago in 1967. Each participant was asked to take the course at his own speed before arriving at Tech. Since only nine of the nineteen participants said they finished the course, its value to the program is questionable.

The faculty meetings held prior to the institute were four. The first one was the telephone conference call previously alluded to several times. In addition to the other items already related, the faculty asked that the Director furnish them with a list of participants, including addresses, the computer configurations available to each participant, and a copy of the programmed

instruction course. The faculty was asked to furnish the Director with any audio-visual equipment needs they had so that the equipment could be scheduled in advance. The Director agreed to secure sample MARC II tapes for use of the cataloging group and for any other data uses found necessary. Finally, the faculty was asked to furnish the Director with an up-to-date salary figure so that their actual pay would be reflected in their institute compensation.

Three days of faculty meetings were scheduled immediately prior to the arrival of the participants. The agenda for these meetings is included in the Appendix (see Appendix C). At the first meeting the faculty received duplicates to the packets each participant was to receive. In addition to the usual "Chamber of Commerce" materials such packets usually contain, the following is a list of the academic materials and supplies in the packet: a COM glossary, COM equipment descriptions and articles, IBM COBOL Language Specifications and Programmer's Guide with accompanying TECHNICAL NEWSLETTERS, an IBM Application Brief describing Florida Atlantic University's system, a flowcharting template, Bibliographies, a class schedule, a list of the names and room assignments of all the participants, an institute brochure, an IBM Data Processing Glossary, COBOL coding sheets, flowcharting forms, "Serials Automation", and a schedule of Manufacturer's Representatives presentations. Each faculty member added material to the above on his area of interest. A nameplate was also included in each packet, and this served as identification to all campus personnel so that faculty and participants could have access to all eating, recreational, library and other services of the campus.

The second day of faculty meetings included a final look at the class schedule, an outline of each faculty member's plan for his formal presentation, the schedule for the informal meetings of the participants, and an outline of the parameters for the group problems. The outlines were valuable because they allowed each faculty member to coordinate his presentations and plans with the other members of the teaching team. The faculty members freely questioned, made suggestions, and discussed one another's plans--and improvements were made.

On the third day of faculty meetings, Mr. A. G. McKee went over the system requirements for Tech's Computing Center. The procedures to be used were presented in writing to each faculty member (see Appendix D). Faculty questions were answered by Mr. McKee and a clear understanding of the Tech center was achieved. The proposed teaching syllabus was the next topic of conversation. The faculty decided to postpone this discussion until the Director could submit a draft to them after the institute was over. The faculty decided to include everything possible in the proceedings of the institute. It will be the most complete document resulting from the program. It will be written by all the faculty and edited and compiled by the Director. Each participant is to receive

a copy and the profession will have access to it by purchase. The participant evaluation will take the form of an anonymous questionnaire. Minor changes in the form were incorporated into the final document as approved by the faculty. This questionnaire is included in the Appendix of this publication (see Appendix E). Faculty evaluation will take place at a critique on the final day of the institute.

Manufacturer's representatives were secured through direct contact with the various firms. Eight major manufacturers were invited to make presentations. The Director worked with each firm individually. The representatives were given the following specific directions: They were to present their firm's hardware, its capabilities, library applications, cost and leasing arrangements, and impending developments of interest to the library user. They could present any "handouts" they desired, and were encouraged to entertain questions from the audience. They were not under any circumstances to participate in questioning representatives from rival concerns. Some of them gave the director a list of their equipment needs for their presentations. The representatives who participated are listed in the schedule published in the Appendix (see Appendix F). It should be noted here that General Electric's representative failed to show up, probably because the Computer Division of G. E. was allegedly sold to Honeywell shortly before they were to appear.

After the arrival of the participants on the fourteenth of June, they were all assigned quarters in one of Tech's high-rise air-conditioned dormitories. At approximately 6:30 p.m. all the participants and faculty met in one of the meeting rooms in the dormitory where the Director briefly acquainted them with Tech and the City of Ruston. Meal tickets were sold to those who wanted them, and preparations were made for the receipt of room rent. Prior to their arrival, the participant's packets were placed in their rooms, so as soon as they arrived, they had them. Materials in the packet were emphasized to the participants in order that they may know how much of it to bring to class with them. The location of the dining hall, library, classrooms to be used by the participants, and recreational facilities were explained, as were the procedures used in each facility. The importance of their "I. D." badges was emphasized. Overall, the group seemed to be very enthusiastic from the very start.

Perhaps a note on the method used to compile these proceedings will be of value or interest. For all the formal presentations (automation of the various processes, COM, Systems Analysis and Flowcharting, etc.) a tape recorder was used to record the actual presentation. These tapes were transcribed and then submitted to the one making the presentation for editing. The edited paper was accepted as submitted with only a few additions such as appendix notes, pagination, and so on. The group proceedings were submitted by the faculty member in charge of the group activity. Changes were made only to achieve more conformity in presentation and format. Other notations were written by

the Director from his notes and knowledge of the overall program. The main difficulty experienced was in capturing on tape the questions of the participants and comments made by faculty members from various points in the meeting rooms. This valuable part of the "feed back" was virtually lost to the record. Another area which was not recorded was the informal meetings both in the dormitory and in the computing center. Mr. Alper's very extensive and intensive demonstration programs were likewise not recorded. If this is ever attempted again, these valuable sessions should be given much thought in order to capture them for the record.

FIRST DAY, June 15

THEORY, TERMINOLOGY, AND TOUR OF THE COMPUTING CENTER

By

A. G. McKEE

THEORY, TERMINOLOGY, AND TOUR OF THE COMPUTING CENTER

By A. G. McKee

First I would like to pass out this general information on the closed shop procedure we maintain in the computing center here at Tech. (See Appendix D) Take one and pass the rest back. Perhaps the first thing we should do is build an information dissemination system to take care of all this stuff.

As Mr. Dyson said, the services of the computing center will be at your disposal for the entire period you are here during our regular closed shop procedure or on a scheduled basis, depending upon what Mr. Gatlin and the other gentlemen decide when the time comes for the actual processing of application programs. The Center will be available on a scheduled basis for you to come in whenever the decision is made that it would be desirable. We will go through this procedure with you in detail right now. I will give just a few remarks about the Computing Center here at Tech and then we will go down and go through it and let you see what we have, how it operates, and just get the lay of the land on what is down there and how we use it.

We do operate an IBM 360 Model 30. A Model 30 is at the low mid-range of IBM 360 computer systems. It is as large a model 30 as we can get core wise; the next step up would be some other model in the 360 system. I think it will be adequate to handle the needs that we find in this group--we certainly hope so. We will do everything in our power to see that it does.

We have two tape drives and three disc drives with a card reader, and printer with various other unit record equipment in the room. I am not going into detail with you on hardware because you are not particularly interested in it. Your interest lies principally in what that hardware can do for you as librarians.

The system is operated on what we call "closed shop" basis--we have trained operators, full-time staff operators, and student operators. The computer system is somewhat complex to operate, as is the operating system that resides in the computer. The user is never allowed to push the buttons of the machine. We leave this to the trained operators so they know at all times what is going on in the system, and can take care of it. We operate the computing system on a closed shop basis for the user who brings his programs--the work to be done--to a dispatching window and leaves that work to be processed during the day and comes back there and picks it up.

We provide key punch service to all users. Now most of you, well, I guess all of you, received this programmed instruction course before you came, and you have learned through it that our principle means of communication with the computer system is through punched cards. This punched card is punched on a machine called a keypunch which operates much like a typewriter. It does print across the top of the card the characters that are punched in the card, but the computer reads the holes in the card, not the printing. We are going to show you how the holes are punched and give you some instructions on the use of the keypunch machine itself downstairs in the Computing Center.

The Computing Center will provide keypunch service to you. You have coding sheets here that will be given you when you start writing your programs. You will write the programs on these coding sheets, bring them to the dispatching window, and at the Computing Center we have keypunch operators who will key-punch those coding sheets for you, and then you may return a short time later to pick up your decks. Be sure to proofread them. Just go through them and see if they look right. We will keypunch and verify everything and they should be right, based on what you put on the coding sheet. Our keypunch girls are like baseball umpires--I tell them to call 'em as you see 'em, so if they see an s as a c, they will keypunch a c. Now, I hope that this type of thing gets caught at the verifying stage, because we have Barbara keypunching and Janet is verifying. The girls do not verify their own punching, so this gives an excellent check for errors. All of your programs should be keypunched correctly. So I ask you, please, when you write on these coding sheets, to write as plainly as possible and as neatly as possible because neatness is of vital importance in transcribing from the coding sheet to the punched card.

Then you will, after getting your programs keypunched, present them into the computing system to be processed. You will probably have errors and will not want to go back through this formal process of getting errors corrected by keypunching through the closed shop system, although you certainly may, if you wish. You have this prerogative. The other possibility is that, hopefully, we will give you enough instruction on the use of the keypunch that you will correct your own errors. Especially if they are just small--one character or figure or something like this. If you do wish to go back through the keypunch service to get corrections made, take a coding sheet and code just that part of your program that needs correcting. Do not submit your whole deck to be done over. Write on the coding sheets just those lines that need corrections, and then when you get those new cards back you may substitute them for the ones in error. You will understand this better after having had experience at it. I am sure Mr. Gatlin will tell you more about this and we will all be working together.

Do you have any questions? Any time you are in the Computing Center and have a question about something, just ask any of us down there and we will

be glad to help you and work with you. If we cannot answer your question, we will find someone who can. I have eight very competent student programmers in the Computing Center who are versed in nearly all the programming languages, so we do have help available if we need it. Let's adjourn now to the Computing Center in the ground floor of this building.

(NOTE: At this point Mr. McKee took the entire group on a detailed tour of the Computing Center. Each machine was explained from the point of view of speed, capacity, and function. This presentation was heavily reinforced by the demonstrations given by Mr. Alper during our "hands on" scheduled hours. The tour terminated in the keypunch room where each faculty member took several of the participants and gave them instructions and experience on keypunching procedures. At the end of this period, all the students were competent enough on the keypunch to make their own corrections. This was the beginning of many opportunities the participants had to use keypunch equipment.)

SYSTEMS ANALYSIS AND FLOWCHARTING

By

SAM A. DYSON

SYSTEMS ANALYSIS AND FLOWCHARTING

By Sam A. Dyson

Your class schedule this afternoon calls for a soliloquy, I guess you might say, on systems analysis and flowcharting. Since many of you have already isolated the area in which you will begin your automation activity, perhaps we are somewhat justified in giving only passing thoughts to systems analysis and giving major emphasis in this institute to flowcharting.

This afternoon we are going to discuss the more important devices in systems analysis, one of which is flowcharting. We are going to discuss kinds and treatment of flowcharts.

You discovered in your programmed instruction book[1] that there are five steps in solving data processing problems. Does anyone want to tell me what they were? Define, Analyze, Program, Implement, and Document your problem. The art work on this flip chart is courtesy of Sam Dyson, MFA (Moderately Finished Art). The five steps used in solving data processing problems then are: (1) Defining the Problem. (2) Analyzing the Problem. (3) Programming the Solution. (4) Implementing the Solution. (5) Completing the Documentation.

Which of these five steps would you suppose is most concerned in systems analysis? All five have implications for systems analysis, but those most concerned are problem definition and analysis.

When one defines the problem, what did your programmed instruction course book tell you happened? One develops a problem statement containing (1) a job description, (2) input information, (3) processing information, and (4) output information. "The final problem statement is a complete outline or narrative containing all the information relevant to the solution of the... problem..."[2] The gathering of this data is part of systems analysis. Here you describe what is going on--what is being done presently. The procedural steps you now take, the forms you now use, the format, contents, and arrangement of those forms, and many other related points. You usually include in the definition of the problem samples of all the forms you use so the person who is going to take this problem can see at a glance exactly what you are presently doing.

What did your programmed instruction course book tell you that problem analysis involved? "...deciding how to proceed in solving the problem and listing the operations that are required."[3] The "deciding" and "listing" are important parts of systems analysis. Tools that are used in

problem analysis, two of which are decision tables and flowcharts, are very important parts of systems analysis. Not only is it important to construct decision tables and flowcharts describing what you want to do, but also one must not overlook the extreme value of first describing what the present practice is. This is all systems analysis.

When you analyze the job as defined, you look at it and ask questions about it. You ask if there is anything you are doing you can leave out. Each step of the procedure is examined. You ask, "Why do we do this?" You try to answer that question honestly. There may be perfectly valid reasons for each step taken. On the other hand, you may do it because it has always been done that way. This kind of analysis will surprise you! There are more things than we like to admit that you and I do every day that we have no reason for doing. We have always done it the way we do it; the one who had the job previously did it that way; and, therefore, we can do it that way, too. There are a lot of little "picky" things that can, if left out of your operation, save you tremendous amounts of time and money over a period of time. You need to ask yourself questions about the steps you outlined up in your job description--why you are doing them; who does them; could someone else do them better; are they done in the proper sequence; or could they just be left out entirely? Flowcharts and decision tables help you do this questioning.

Beyond these statements, systems analysis involves an overall but highly detailed look at the operations in a business, firm, or institution. It seeks to discover what is now being done; the procedures, equipment, people and forms used; and the costs required for each step taken. Then, it tries to rearrange all the ingredients in the organization to achieve the most efficient, logical, and productive methods for both doing the same jobs and making it possible to do more jobs with the same resources.

We had a systems analysis of Prescott Library a couple of years ago in conjunction with a university-wide analysis. The library's analysis was about two and one quarter inches thick and included forms, charts, graphs, statistics and a step-by-step detailed description of everything we do in the library. When the analyst sat down and went through it, he knew every process that we have in the library--it was quite a formidable volume when we got through it.

Once you have defined and analyzed your problem, your next step is to program the solution. This is where analysis and programming overlap. Your analysis has made it possible for you to see areas for improvement. You have changed some steps completely, altered the sequence of steps, redesigned software, and, in short, have arrived at a whole new set of procedures. The new procedures have been flowcharted, decision tables have been designed, and now you are ready to write the program in a language that your computer can use. We will use the COBOL language, which is a very sophisticated,

flexible, and compatible language to bibliographic data. If you have designed your flowcharts and decision tables well, the Procedure Division of your COBOL program will be a very simple translation of the steps in the flowchart into the form required by the language.

After programming your solution, the next step is to implement your solution on whatever equipment you have--whether abacus, quipus, typewriter, adding machine, TWX, calculator, computer, or even a pencil and piece of paper. This is where you run your program with test data, and "de-bug" it--in other words, get the mistakes out. At this point, adjustments will be made in your program and also in your flowchart. Documentation requires that your final flowchart exactly reflect how the finished program is written.

Here at Louisiana Tech we are at this point in our serials automation program. We have finished de-bugging and are ready to complete keypunching our serials holdings file. We have these nine programs on serials that are ready to run with actual data.

The material you have gathered--your problem definition, analysis, your COBOL program, flowcharts, decision tables, old and new forms--is all organized as a part of your documentation. You will not stay where you are forever, and you need to give the next fellow who follows you all the records so he can see how and why you decided to do what you did. When someone else comes along and asks, "Why do we do this?", he can go back to your documentation and at least offer an explanation.

In solving data processing problems you will, consciously or unconsciously, actually perform each one of the above steps. They may not be distinctly done--they all have a tendency to overlap--but when you finish the job, you will find that each of the steps were completed. For this reason, you really may do flowcharting in problem definition, analysis or programming, and will definitely include your prepared flowcharts in documentation.

You will recall from our flip chart that the second thing we are going to discuss this afternoon is some important devices for solving problems. Two I will only mention and give you a reference on them in case you want more information. One is the Program Evaluation Review Technique, commonly referred to as PERT. This device is used rather extensively by the armed forces and is a very elaborate set of steps to be taken to evaluate work flow. A second device, called Work Breakdown Structure (WBS), is used by the building industry as a logistics device to assure construction materials and equipment are on site at the precise time they are needed. If you would like to read further on these two devices, Fred L. Bellamy has an excellent article on them in the JOURNAL OF LIBRARY AUTOMATION, vol. 2, no. 4, 1969, pages 187-217.

Decision tables are useful when you ask yourself a question answerable by "yes" or "no", and based upon your answer any one of several steps may be taken. This device was outlined for you in rather minute detail in your programmed instruction course.[4] For more complicated programs with various possible actions based on equally varied decisions, you will want to construct these tables in order to be sure you have considered every conceivable alternative. Mr. Gatlin will point out, I am sure, that the computer will make no assumptions unless it is programmed to do so. You will get a nasty error message and your program will not continue past the point where you neglected to tell it what to do under a particular set of circumstances. This kind of precise thinking will be very good for you in the next two weeks, for it will not allow you to leave any "loose ends" lying around.

The device on which we want to spend the remaining time we have is the flow chart. There are two kinds of flowcharts with which you will have experience: the program flowchart and the system flowchart. If you have your template, the envelope it comes in has on one side the program symbols, and the other has system symbols. You will notice that there are several that are identical. These are basic symbols. Specifically they are input-output, processing, and direction-of-flow. On a flowchart, the normal flow direction is left to right, top to bottom. As long as your chart flows normally, you do not have to indicate with an arrowhead the specific direction. If you depart from the normal flow, however, you must add an arrowhead to your direction-of-flow line. We'll look at a couple of flowcharts to prove that you are more familiar with flowcharting than you perhaps realize.

We have mentioned system and program flowcharts, but first we need to define a flowchart in general:

(1) ...a graphic representation of the definition, analysis, or solution of a problem, in which symbols are used to represent operations, data, flow, equipment, etc.[5]

(2) ...a means of presenting information and operations so that they are easy to visualize and follow. They show the flow of data through an information processing system, the operations performed in the system, and the sequence in which they are performed.[6]

(3) ...a combination of symbols that represent the sequence in which a combination of operations is to be performed.[7]

In short, a flowchart is a picture of the steps you take toward a solution to a problem--whether it be literary, administrative or computer oriented.

You have already seen some of the value of flowcharts, but let me be more definite. They serve the following purposes: A flowchart ...

(1) ... defines steps to be taken in problem solving.

(2) ... establishes the most efficient sequence for these steps.

(3) ... provides a picture of the entire problem.
(4) ... promotes understanding of the problem and solution.
(5) ... aids in the documentation of the solution.
(6) ... presents graphically the "...logic used for coding, desk checking, and debugging while testing."[8]
(7) ... permits verification "...that all conditions possible have been considered."[9]

Flowcharting is valuable whether or not you ever use a computer. It is an everyday tool that you can use to get a deeper understanding of your present work. Now for those flowcharts I promised.

(Plate I) This is a flowchart of a literary outline which traces the flow and limits of ideas. It happens to be one I constructed for the preparation of this paper. You can readily see the logic and relationship of the various parts to the whole. It is incomplete primarily because I could not get the complete chart on a single page. It is called PRINCIPLES OF FLOWCHARTING, and is divisible into six parts: introduction, definitions, purpose, procedure, examples, and problems. I have further broken down the introduction part to let you see the relationships. You will recognize that we are now at the point labeled "Devices in Problem Analysis" at the sub-division called "Flowchart". From just what you see here, we still have a long way to go, do we not? In preparing any speech you are concerned about the logical flow of ideas. Your outline is, in a sense, a flowchart.

(Plate II) Another familiar sight to you, especially the administrators in the group, is what we all refer to as an organizational chart. This, too, is a flowchart which traces the flow and limitations of responsibility. At the top we have the Director of Libraries with his advisory committees and special personnel. We are proposing here four coordinators: Technical Services, Administrative Services, Readers' Services, and the new Media Services. This chart details, to some degree, the Media Coordinator's responsibilities. He (or she) has much to do. The service, scheduling, media systems, Electronic Programs Learning Center, and Microprint Media personnel are all his responsibility. He will work closely with the other coordinators and even with the area librarians to take maximum advantage of the non-print media services his division offers. One can see at a glance what his responsibilities and limitations are. Were this a complete chart for our library, with a very little effort one could see his place in the overall picture of library service at Tech. So you see, flowcharting is something you have been doing in one form or another all along.

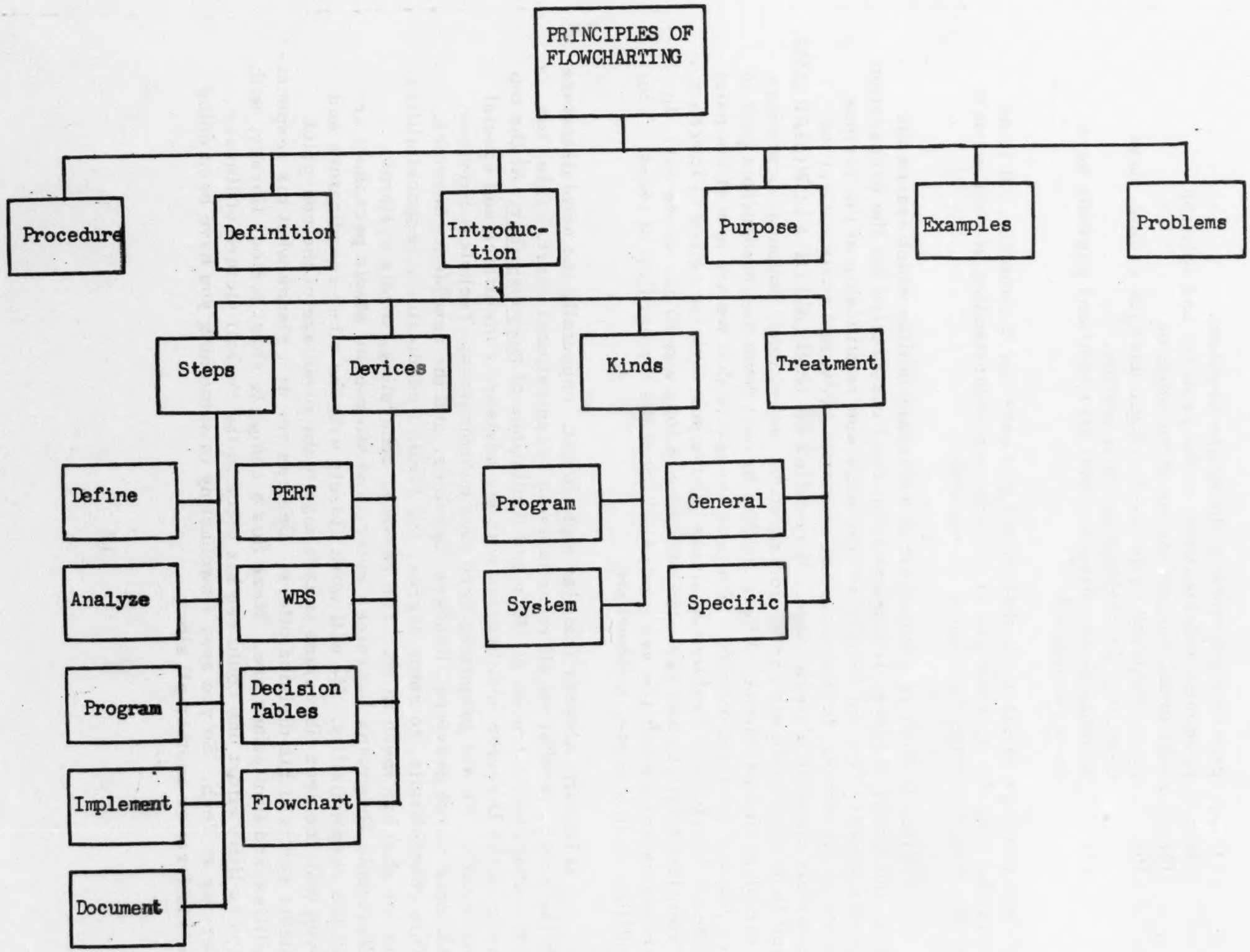

PRINCIPLES OF FLOWCHARTING
Procedure
Definition
Introduc-tion
Purpose
Examples
Problems
Steps
Devices
Kinds
Treatment
Define
Analyze
Program
Implement
Document
PERT
WBS
Decision Tables
Flowchart
Program
System
General
Specific

PLATE I

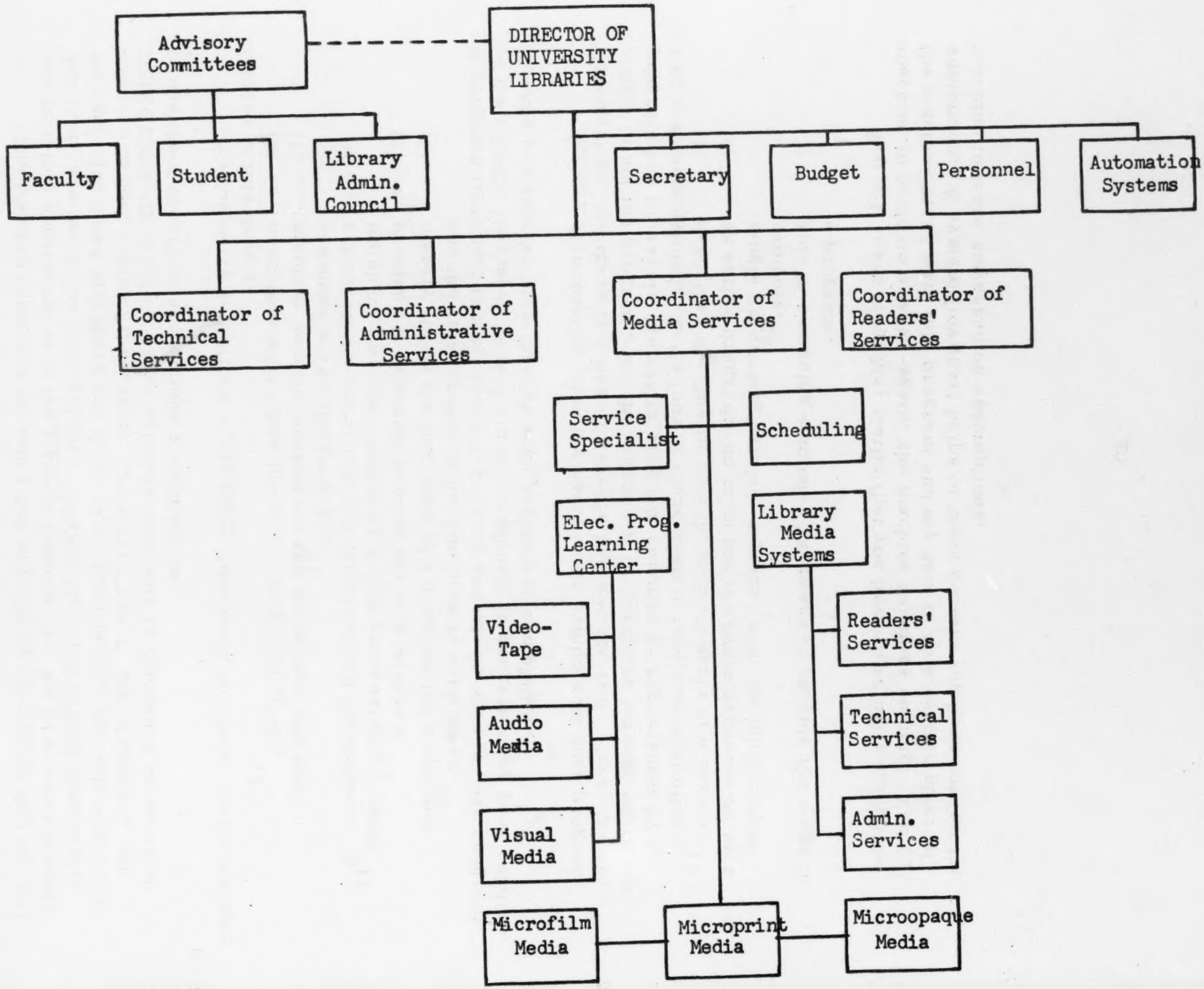

Advisory Committees
DIRECTOR OF UNIVERSITY LIBRARIES
Faculty
Student
Library Admin. Council
Secretary
Budget
Personnel
Automation Systems
Coordinator of Technical Services
Coordinator of Administrative Services
Coordinator of Media Services
Coordinator of Readers' Services
Service Specialist
Scheduling
Elec. Prog. Learning Center
Library Media Systems
Video-Tape
Audio Media
Visual Media
Readers' Services
Technical Services
Admin. Services
Microfilm Media
Microprint Media
Microopaque Media

PLATE II

The literary flowchart we saw a few minutes ago promised that we will now turn to a consideration of the kinds of flowcharts. We have already noted that there are two kinds of flowcharts: PROGRAM and SYSTEM flowcharts. We have also noted that there are three basic flowcharting symbols which are common to both kinds of flowcharts: INPUT-OUTPUT, PROCESSING, and DIRECTION-OF-FLOW. Other symbols used will be discussed as occasion to use them occurs in our various presentations.

The following definitions of program flowcharts will help clarify the usefulness of this device:

(1) ... describes what takes place in a stored program.[10]
(2) ... displays specific operations and decisions, and their sequence within the program.[11]
(3) ... a diagram of operations and decisions and the sequence in which they are performed by a data processing computer.[12]
(4) ... provides a pictorial description of a program.[13]
(5) ... clearly shows the functions of a program (or a routine) and the relationship of the functions to each other.[14]

A program flowchart is what you will prepare and use in writing your program in the COBOL language. It will aid tremendously in programming your solution. It leads you step-by-step through your problem to completion.

System flowcharting uses the same basic symbols as does program flowcharting, but there is a vast difference between the two. Here, the emphasis is not the program, but the equipment or hardware through which the program has to travel. An entire program run may be represented by a single system symbol. Let's look at these system flowchart definitions:

(1) ... describes the flow of data through all parts of a system.[15]
(2) ... an entire program run or phase is always represented by a single processing symbol, together with the input-output symbols.[16]
(3) ... aids in assigning computer hardware to execute the steps in a program.

You will learn from Mr. Gatlin that you have to actually assign the machine to perform a task--again, the machine assumes nothing. You tell the machine that I want this program and my data is on a certain piece of equipment. A system flowchart helps to make certain you have not left the machine to make unwarranted assumptions.

Now, let's see if we can distinguish between the two kinds of flowcharts.

(1) ... many steps of a program flowchart may take place at one point or symbol in a system flowchart.

(2) ... the shape of the symbols used in a system flowchart specify the machine which will perform the function, whereas the shape of the symbols used in a program flowchart specify the format of the input-output data used.

(3) ... a system flowchart traces work flow and progress through the hardware or machinery of a system, while a program flowchart traces the sequence, logic, and progress of the program through the system.

All these symbols you will find on your flowcharting template. Unfortunately, these symbols are not standarized, and so it is very helpful if in your documentation you indicate what your symbols mean by use of a Table of Symbols--especially if your chart is to be universally used.

Now, let's turn to flowchart treatment. There are two ways of treating a flowchart, and we will in the course of this institute, see both kinds: general or MACRO flowcharts, and specific or MICRO flowcharts. Some of the examples we have for you today will be very general; others you design in your group sessions will be extremely specific. In your first study of a particular problem, you will probably need a general overview of your problem--a MACRO flowchart will do very well. Later on, it may be that each one of the steps you made in the MACRO chart will become a whole page of symbols in a MICRO chart.

With all that for a background, let's get down to specifics. There is a procedure which I have found very useful in working out a flowchart problem. (Plate III) First of all, you isolate the segment to be automated. For some of you that is a real problem, and for others it was no problem at all--you were told, "We've got to automate circulation or lose our status in the academic community!" Well, somebody has to decide where to begin. There are definite ways to make this decision, but, in the interest of time, we will not go into them here. Then, you analyze the present practice. In your analysis, the first thing you will do is to list the steps you take now. You need to firmly understand the way the job is now done. After you have all the steps listed, look at the list again. Ask yourself, "Are all the steps there?" If you leave out a step, it will cause you some grief later on. Then ask yourself two more questions: "Are all the steps listed necessary?" and "Are they in the proper sequence?" Based on your answers to these questions, you change, adapt, and improve the list.

Now, friends, when you get to this point your operation will improve almost automatically, whether you ever do anything with computers or not.

FLOWCHARTING PROCEDURE

A. Isolate the segment to be automated.

B. Analyze the present practice.
   1. List the steps taken.
   2. Examine the sequence.
      a. Are all steps necessary?
      b. Are they in the proper sequence?
      c. Change, adapt, improve.
   3. Note the type of operation for each step.
      a. Input
      b. Processing
      c. Output
   4. Fit each step into the appropriate symbol.
   5. Add direction of flow lines.

C. List steps necessary prior to and following this segment.
   1. Information
   2. Procedures
   3. Sequence
   4. Fit each of these steps into a flowcharting symbol, if required.

D. Place C.4. and B.4. together, if practical.

E. Using C.4. or B.4. above, draw the flowchart.

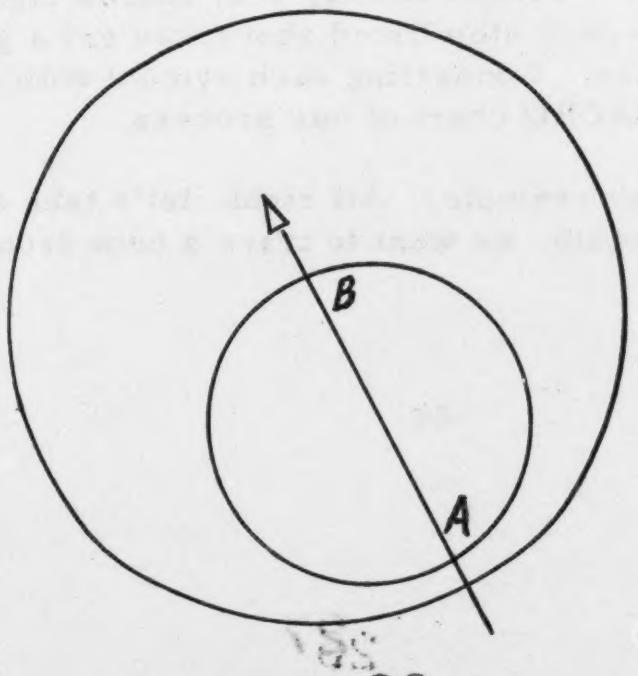
PLATE III

This drill cannot help but improve your operation--if nothing else, it will acquaint you with what is going on in your library.

The next thing we will want to do in this analysis is to note the type of operation that each step calls for, whether input, output, processing, or whatever. I usually indicate this by putting the symbol beside the statement concerned. The final step in this analysis is to fit each step into the appropriate symbol with the flow direction indicated. Voila! You have flowcharted the segment.

There are some additional things we should not overlook at this point. When you choose a segment to be automated, you must not isolate it to the extent it becomes an unassociated process. It must remain in context with the processes that precede it and those that follow it. You need to have well in mind what happens before the material gets to your segment, and what happens to it after it leaves this segment. You should also keep in mind that any single automated segment must be designed to be compatible with the overall system design you envision. You can keep these things in mind best if you list them. They, too, may be put into symbols for possible future reference. They will be helpful if you decide later on to automate those processes, too.

Let's take an example. The segment we have isolated for automation is MONTHLY PERIODICAL CHECK-INS. We have automatically set some of the parameters of our problem: (1) periodicals, (2) monthly, (3) check-in procedure only, and we will also say (4) they are current subscriptions--no new titles included. What you want to do is trace a monthly periodical from the time it gets to the serials operation until it leaves. Of course, there is a lot that happens to a periodical before it is considered a current acquisition; select, order, set it up in the files, receive it, catalog it, etc. before you get to the place we want to start. Also, one of our parameters is that the present procedure we are going to flowchart is a manual system, and we are only concerned with one copy of the journal. You are only tracing the progress of the periodical from point A to point B.



Shall we list the steps taken in our arbitrary example?

(1) Receive the issue.

(2) Batch for check-in.

(3) Alphabetize by title.

(4) Take to record file.

(5) Find the record card.

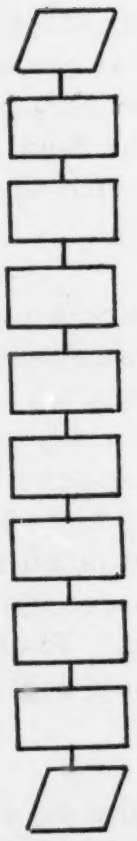
(6) Correct the alphabetical arrangement.

(7) Record the issue on the card.

(8) Write the call number on the issue.

(9) Batch the completed issues.

(10) Forward them for shelving by others.

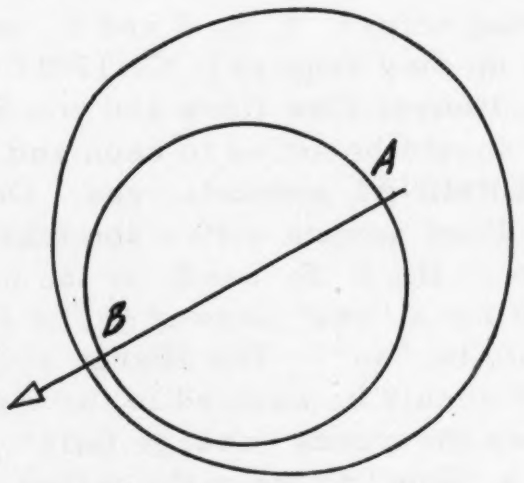


Now, this arbitrary, fictitious list of steps is more or less complete. We ask ourselves questions about this list: Are all the steps necessary? Can number four be omitted? Are they already at the record file when they get to serials? Can 2 be omitted? Do you really batch them for check-in? Is 6 necessary? Is 3? Does the same person do 7 and 8? If not, why not? Are the steps in the correct sequence? Should 3 come before 2? Should 9 be done during 8?

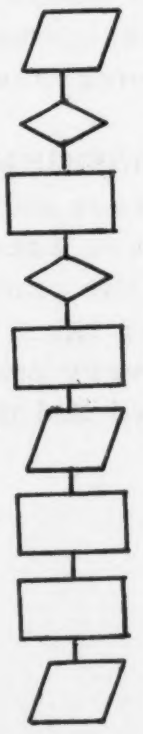
For purposes of illustration let's assume this is the sequence we want. The next thing we want to note is the kind of operation each step requires. Numbers 1 and 10 are different from the others. What kind of a process is number 1? INPUT, that is correct. How about number 10? OUTPUT, right. Now, what are all the rest? PROCESSING, yes, that is right. By placing small symbols adjacent to each step listed above, we get a good idea what our final flowchart will look like. Connecting each symbol with a direction-of-flow line, we have a slightly MACRO chart of our process.

Do you want another example? All right, let's take a circulation problem. Putting our circles down again, we want to trace a book from the time it is

brought to the charging desk until it leaves with the patron and the cards are properly filed. Again, from A to B.



Our parameters are as follows: (1) it is a manual system; (2) a one card charging system is used with color coded card cover indicating date due; (3) These are books which have been in the collection for some time--no new books; (4) we use a two week charge; (5) it is a normal charge--no special features. What is the first thing we do? Yes, we list the steps:



(1) Student brings the book to the desk to charge it.

(2) Check student I. D. card.

(3) Student signs the book card indicating address.

(4) Compare I. D. information with that on the card.

(5) Stamp the date due in the book.

(6) Student takes the book and the I. D. card.

(7) Stamp the date due on the book card.

(8) Attach color coded card cover.

(9) File book card by call number in circulation file.

What is next? Ask yourself all the proper questions: Are the steps in logical order? Are they all necessary? Assuming that they are, what do you do next? That's right, you put a symbol beside each step. What is the first step? INPUT, that is right. Is there any other step that could be input? NO, not in this MACRO chart. Which steps could involve a decision? Numbers 2 and 4. Look on your flowcharting template under program symbols and see if you can

find one for a decision. The DIAMOND shaped one is the decision symbol. Put that beside each of the steps number 2 and 4. Which of the remaining steps are processing steps? 3, 5, 7 and 8, yes! There are two steps remaining; what symbols do they require? OUTPUT is correct. Connecting these symbols with direction-of-flow lines and you have a near complete flowchart. One other symbol should be added to each end of the chart--what do you think that might be? TERMINAL symbols, yes. One could be labeled "start" and the other "stop". Does anyone notice something we have not allowed for? What if the picture on the I. D. card, or the name and address do not match? We have accounted for a "yes" answer to the decision symbol, but what happens if the answer should be "no"? The charge should fail, should it not? Another processing symbol should be entered to the right of the first decision symbol in which are written the words "charge fails", and then another terminal symbol indicating a "Stop" to the right of that. The "no" branch beside step 4 can lead to the same two added symbols above--be sure you add an arrowhead to the line violating our normal flow pattern. There are many other steps we could take on this problem, but this is sufficient for our present purposes. (See Plate IV for completed flowchart)

It would not be fair of me to let you go this afternoon without giving you an assignment. Therefore, please do the following and let me look at it before tomorrow morning. You will have some time now to get started.

ASSIGNMENT: Choose a well defined and limited problem area in your library and flowchart the present practice. (After a few minutes the participants were asked to report on what area they had chosen for flowcharting. Some of the problems were too broad for our purposes and they were asked to further limit them. It is interesting to note that there were no two problems alike--every one of them chose a different problem area. The charts were completed and the faculty members made suggestions for improvement.)

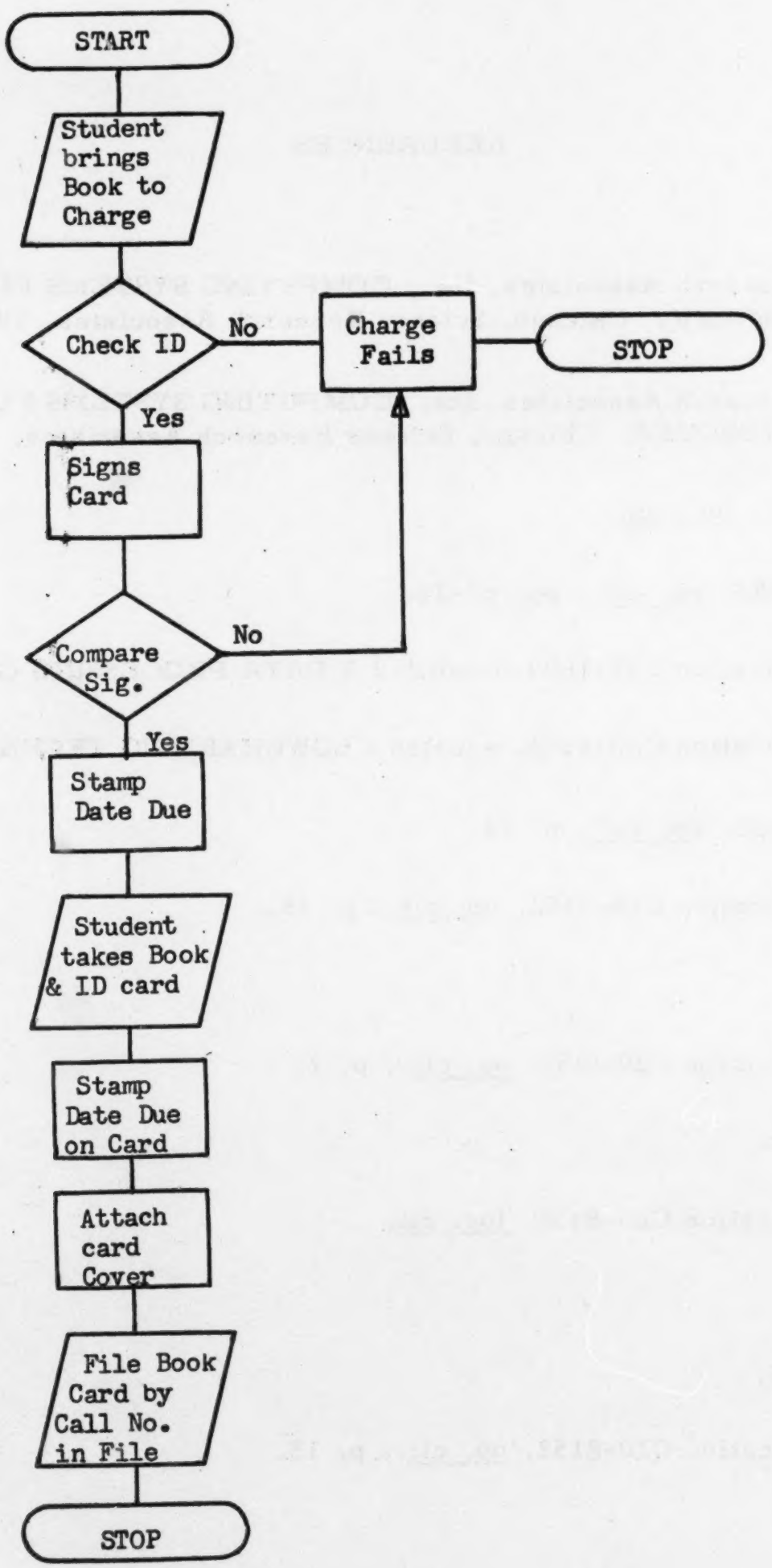

START
Student brings Book to Charge
Check ID
No
Charge Fails
STOP
Yes
Signs Card
Compare Sig.
No
Yes
Stamp Date Due
Student takes Book & ID card
Stamp Date Due on Card
Attach card Cover
File Book Card by Call No. in File
STOP

PLATE IV

REFERENCES

[1]Science Research Associates, Inc. COMPUTING SYSTEMS FUNDAMENTALS OVERVIEW. Chicago, Science Research Associates, 1969. p. 1.

[2]Science Research Associates, Inc. COMPUTING SYSTEMS FUNDAMENTALS TECHNIQUES. Chicago, Science Research Associates, 1969. p. 1.

[3]OVERVIEW, loc. cit.

[4]TECHNIQUES, op. cit., pp. 52-73.

[5]IBM's publication C20-1699-0 entitled A DATA PROCESSING GLOSSARY. p. 24.

[6]IBM's publication C20-8152, entitled FLOWCHARTING TECHNIQUES. p. 1.

[7]TECHNIQUES, op. cit., p. 74.

[8]IBM's publication C20-8152, op. cit., p. 15.

[9]Loc. cit.

[10]IBM's publication C20-8152, op. cit., p. 1.

[11]Ibid., p. 15.

[12]IBM's publication C20-8152, loc. cit.

[13]Loc. cit.

[14]Ibid., p. 15.

[15]IBM's publication C20-8152, op. cit., p. 15.

[16]Loc. cit.

SECOND THROUGH FOURTH DAY
June 16 -18

COBOL PROGRAMMING LANGUAGE

By

ROLAND D. GATLIN

COBOL PROGRAMMING LANGUAGE

Instructor: Roland Gatlin

Summary by Sam Dyson

Mr. Gatlin began his three day presentation with a brief survey of how a computer works. He presented the "on" - "off" binary principle and transferred this concept to the current of a core of computer memory. The bit, byte, and character storage was clearly, but rapidly presented with some reference to hexadecimal representation.

Next his attention was turned to computer logic. He noted that contrary to common belief, a computer is not a "mechanical brain" but a tool just as a calculator, and adding machine, or any other piece of equipment. A computer is only as accurate and efficient as the data fed into it and programmer instructing it. A computer can assume nothing. Therefore, one must consider every conceivable condition in instructing a computer; otherwise, he will be asking the computer to make an assumption. Flowcharts and decision tables are tools which are used to make this problem easier.

In instructing a computer, one must identify the program, assign the equipment to be used, describe in detail the data which will be presented and the storage areas required, and then outline in simple step-by-step statements how the problem is to be solved. COBOL programming language lends itself well to this kind of problem solving.

Mr. Gatlin presented COBOL in its four divisions. Each division was considered with emphasis on the simplest required statements. In order to illustrate the divisions, the students were asked to code and punch a set of address cards in the following format:

Card one:

name	cols. 1-30
institution	31-60
sex	61, value, M if male, F if female
participation	62, value, 1 if faculty, 2 if student
room	63-65
telephone	66-69
blank	70-79
code	80, value, 1

Card two:

street address	cols.	1-30
city-state		31-55
zip code		56-60
blank		61-79
code		80, value, 2

During the next class period, these cards were collected and duplicated so that each class member was given a complete set including faculty.

Using these address cards as data, the class was asked to flowchart, code, keypunch, and run a class directory for their use. They were given the required control cards, and the faculty helped them to get started.

The first program produced an unformatted printing of the information contained on the cards in the order appearing on the cards. (See Flowchart A, Program A, and Printout A.) By the end of the second day of COBOL language instruction, every member of the class had succeeded in this program.

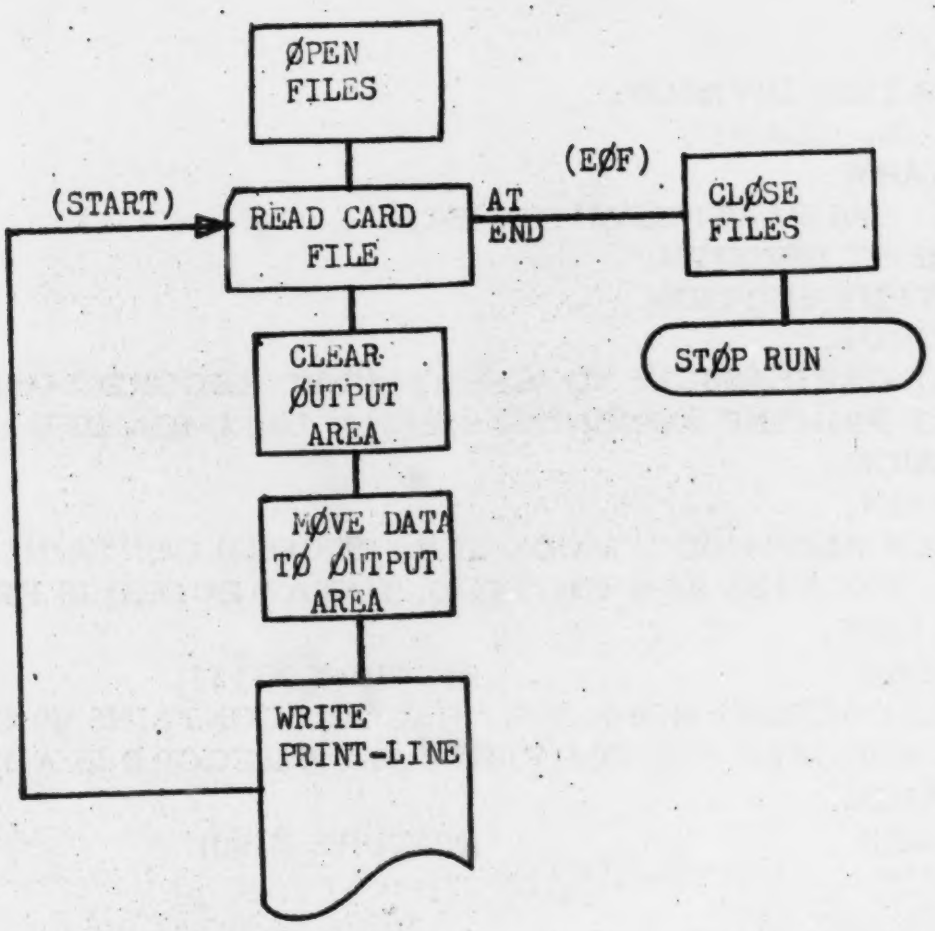
The second program produced a formatted list with uniform spacing, and having little relationship to the appearance of the data on the cards. (See Flowchart B, Program B, and Printout B.) This gave every participant a class directory.

The third program asked for a selective printout of all the participants from East of the Mississippi River, and a count of all the participants from West of the Mississippi River. (See Flowchart C, Program C, and Printout C.)

At the end of the second day of instruction in COBOL the class was asked to take the COBOL EXERCISE (which see, following Printout C). This was an anonymous exercise, and was very revealing with reference to our desired success. The entire faculty helped to correct misconceptions and to give help as requested in the exercise. The faculty was very pleasantly surprised at the grasp the students had of the COBOL language at this point.

With this background, and with successful experience with the computer, the participants were now ready to tackle various problem areas of library technology. The success of the students bears testimony to the excellent instruction which Mr. Gatlin presented, and to the very helpful attitude of the faculty.

Of course, COBOL was used throughout the institute, and so the participants had ample experience with it in relation to library problems. This three day introduction gave the participants an idea of the power, use, and flexibility of the COBOL language.


ØPEN
FILES
(START)
READ CARD
FILE
AT
END
(EØF)
CLØSE
FILES
STØP RUN
CLEAR
ØUTPUT
AREA
MØVE DATA
TØ ØUTPUT
AREA
WRITE
PRINT-LINE

Flowchart A

PROGRAM A

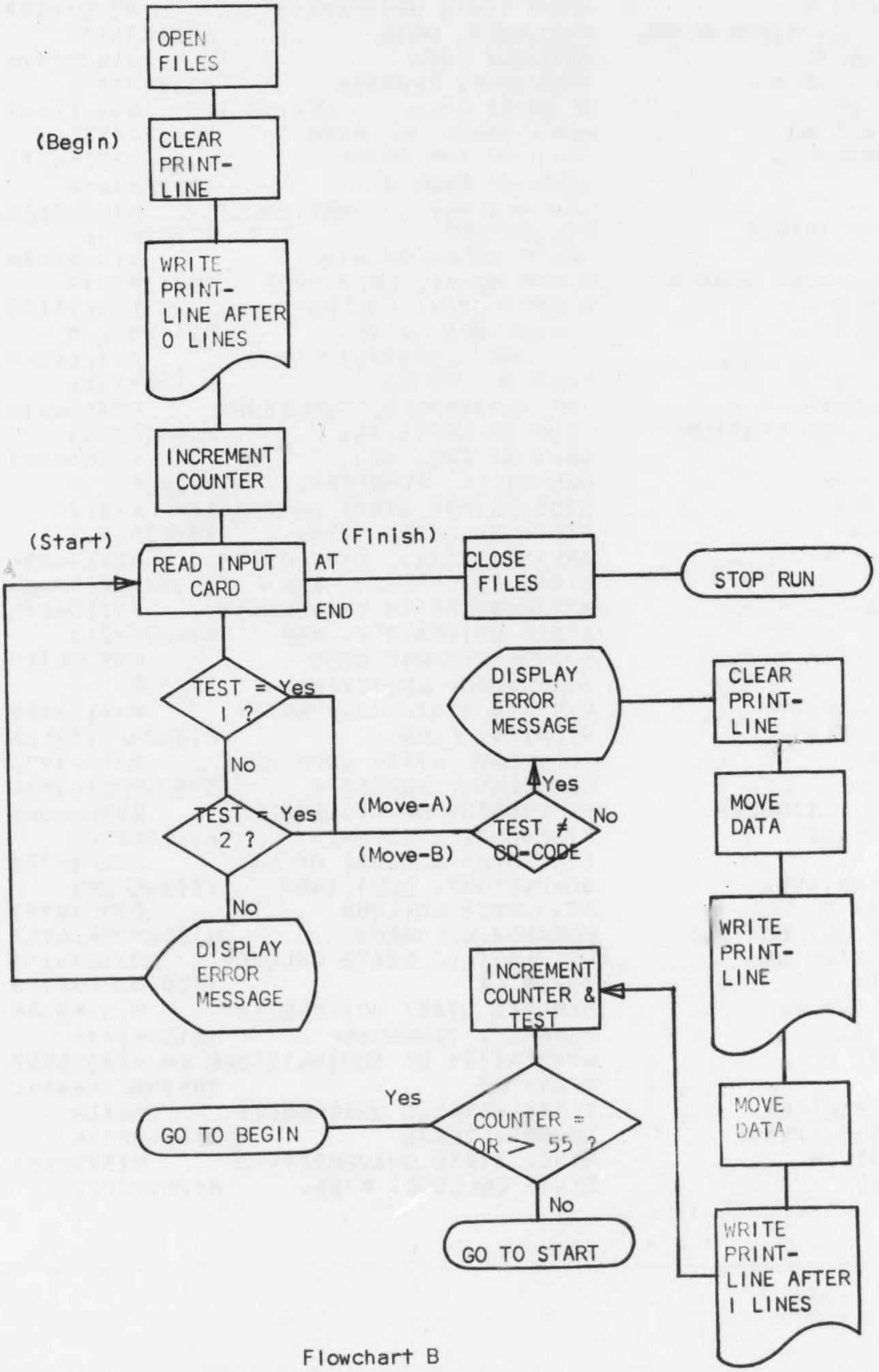
```
IDENTIFICATION DIVISION.
PROGRAM-ID.  'LAI01'.
AUTHOR.  AHW.
REMARKS.  LAI PARTICIPANTS LIST.
ENVIRONMENT DIVISION.
INPUT-OUTPUT SECTION.
FILE-CONTROL.
    SELECT CARD ASSIGN TO 'SYS012' UNIT-RECORD 2540R.
    SELECT PRINTER ASSIGN TO 'SYS014' UNIT-RECORD 1403.
DATA DIVISION.
FILE SECTION.
FD  PRINTER RECORDING MODE IS F, RECORD CONTAINS 133 CHARACTERS,
    LABEL RECORDS ARE OMITTED, DATA RECORD IS PRINT-LINE.
01  PRINT-LINE.
    02  FILLER                    PICTURE X(133).
FD CARD RECORDING MODE IS F, RECORD CONTAINS 80 CHARACTERS,
    LABEL RECORDS ARE OMITTED, DATA RECORD IS ADD-CARDS.
01  ADD-CARDS.
    02  FILLER                    PICTURE X(80).


PROCEDURE DIVISION.
    OPEN INPUT CARD.  OUTPUT PRINTER.
START.  READ CARD AT END GO TO EOF.
    MOVE SPACES TO PRINT-LINE.
    MOVE CARD TO PRINT-LINE.
    WRITE PRINT-LINE.
    GO TO START.
EOF.  CLOSE CARD, PRINTER.
    STOP RUN.
```

GUTHRIE, GERRY D.
RESC. CTR. 1314 KINNEAR RD.
KENNEDY, JOHN P.
1308 VALLEY VIEW RD.
BRUCE H. ALPER
100 ROYAL PALM WAY
TRIBBLE, EDWARD J.
RT 1 BOX 57
MAYO DRAKE
3756 RICHMOND AVENUE
MITCHELL L. POUNCY
BOX 10031 SOUTHERN BRANCH
FERRARA,MARK M
25 MANOR DRIVE
DUDLEY YATES
ROUTE 2 BOX 667 D
F. LANDON GREAVES
P.O. 302 COLLEGE STATION
HUGH A. BROWN
BELMONT COLLEGE
JOHN M. CARTER
P.O. BOX 5346
TAYLOR, GERRY M
BOX 1017
TAYLOR, MYRA
BOX 1017
DINO A ALBERTI
P. O. BOX 607
EDWARD E. CARRAWAY
1547 N. YALE BLVD.,
DAVID ARCHER
1100 20 ST NW
AMBLER, MARY ELIZABETH
929 ROBERT PLACE
WHITE, ANNA H.
231 CARROLLTON AVE.
GRAHAM SANDRA D
840 PLYMOUTH DR. BOX 202
MC DONALD BAXTER JR
2207 GALE ST
WICKER, WILLIAM W.
924 MOSBY ROAD
GIBSON DENNIS A
P O BOX
JOHN JOSEPH MINITER
13511 HEARTSIDE PLACE
ROLAND D. GATLIN
P. O. BOX 863

OHIO STATE UNIVERSITY M13223545
COLUMBUS, OHIO 43212M1322
GEORGIA TECH M13202778
DUNWOODY, GEORGIA 30338M1320
FLORIDA ATLANTIC UNIVERSITY M13212481
BOCA RATON, FLORIDA 33432M1321
UNIV OF THE SOUTH M22144123
SEWANEE TENNESSEE 37375M2214
LSU MED SCH IN SHREVEPORT M13143468
SHREVEPORT 71102M131
SOUTHERN UNIVERSITY M23093974
BATON ROUGE, LOUISIANA 70813M2039
NEWARK STATE COLLEGE M23173183
NEWARK,NEW JERSEY 07106M2317
STETSON UNIVERSITY M23154214
DELAND FLORIDA 32720M2315
SOUTHEASTERN LA. COLLEGE M23154214
HAMMOND LOUISIANA 70401M2315
BELMONT COLLEGE M23084061
NASHVILLE, TENNESSEE 37203M2308
MISSISSIPPI STATE UNIVERSITY M2312
STATE COLLEGE, MISS. 39762M2312
ARKANSAS STATE UNIVERSITY M22134034
STATE UNIVERSITY, ARK 72467M2213
ARKANSAS STATE UNIVERSITY F32134034
STATE UNIVERSITY, ARK 72467F3213
LA POLYTECHNIC INST M23064269
JONESBORO, LOUISIANA 71251M2306
WICHITA STATE UNIVERSITY M23133586
WICHITA, KANS. 67208M23133586
CLEVELAND STATE COMM COLL M23103872
CLEVELAND TENNESSEE 37311M23103872
THE LINDENWOOD COLLEGES F23024866
KIRKWOOD, MISSOURI 63122F2302
CENTENARY COLLEGE OF LA. F23014787
SHREVEPORT, LOUISIANA 71105F2301
FT. LEWIS COLLEGE F23034787
DURANGO,COLORADO 81301F23034787
NORTHEAST LA STATE COLLEGE M23074194
MONROE LA 71201M23074194
MEMPHIS STATE UNIVERSITY M23183084
MEMPHIS, TENNESSEE 38116M2318
UNIVERSITY OF SOUTHWESTERN LA M23054592
PERRY LA 70575M23054592
TEXAS WOMAN,S UNIVERSITY M2316
DALLAS, TEXAS 75234M2316
MISS. STATE UNIVERSITY M13232481
STATE COLLEGE, MISS. 39759M1323

PRINTOUT A


OPEN FILES
(Begin)
CLEAR PRINT-LINE
WRITE PRINT-LINE AFTER 0 LINES
INCREMENT COUNTER
(Start)
READ INPUT CARD
(Finish)
AT END
CLOSE FILES
STOP RUN
TEST = 1 ?
Yes
No
TEST = 2 ?
Yes
No
(Move-A)
(Move-B)
DISPLAY ERROR MESSAGE
Yes
TEST ≠ CD-CODE
No
DISPLAY ERROR MESSAGE
CLEAR PRINT-LINE
MOVE DATA
WRITE PRINT-LINE
INCREMENT COUNTER & TEST
Yes
COUNTER = OR > 55 ?
GO TO BEGIN
No
GO TO START
MOVE DATA
WRITE PRINT-LINE AFTER 1 LINES

Flowchart B

SOURCE STATEMENT CBD CL3-7 12/22/70

```
IDENTIFICATION DIVISION.
PROGRAM-ID. 'LAI2'.
AUTHOR. WWW.
REMARKS. INSTITUTE DIRECTORY - SECOND EDITION.
ENVIRONMENT DIVISION.
INPUT-OUTPUT SECTION.
FILE-CONTROL.
    SELECT CARD-IN ASSIGN TO 'SYS012' UNIT-RECORD 2540R.
    SELECT DIRECTORY ASSIGN TO 'SYS014' UNIT-RECORD 1403.
DATA DIVISION.
FILE SECTION.
FD  CARD-IN RECORDING MODE IS F, RECORD CONTAINS 80 CHARACTERS,
      LABEL RECORDS ARE OMITTED, DATA RECORDS ARE RECORD-A,
      RECORD-B.
01  RECORD-A.
    02  NAME          PICTURE X(30).
    02  INST          PICTURE X(30).
    02  SEX           PICTURE A.
    02  CODE-PART     PICTURE 9.
    02  ROOM          PICTURE XXX.
    02  TELEPHONE     PICTURE 9999.
    02  FILLER        PICTURE X(10).
    02  CD-CODE       PICTURE 9.
01  RECORD-B.
    02  ST-ADD        PICTURE X(30).
    02  PLACE.
        03  CTY-ST    PICTURE X(25).
        03  ZIP       PICTURE X(5).
    02  FILLER        PICTURE X(19).
    02  CARD-CODE     PICTURE 9.
FD  DIRECTORY RECORDING MODE IS F, RECORD CONTAINS 133 CHARACTERS
      LABEL RECORDS ARE OMITTED, DATA RECORD IS PRINT-LINE.
01  PRINT-LINE.
    02  FILLER        PICTURE X(20).
    02  PHONE.
        03  XCHANGE   PICTURE X(4).
        03  NUMBER    PICTURE 9(4).
        03  FILLER    PICTURE XX.
    02  DATA-FIELD    PICTURE X(30).
    02  FILLER        PICTURE X(73).
WORKING-STORAGE SECTION.
77  COUNTER           PICTURE 99      VALUE ZERO.
77  TEST              PICTURE 9       VALUE 1.
PROCEDURE DIVISION.
    OPEN INPUT CARD-IN, OUTPUT DIRECTORY.
BEGIN.
    MOVE SPACES TO PRINT-LINE.
    WRITE PRINT-LINE AFTER 0 LINES.
    MOVE 01 TO COUNTER.
START. READ CARD-IN AT END GO TO FINISH.
    IF TEST = 1 GO TO MOVE-A.
    IF TEST = 2 GO TO MOVE-B, OTHERWISE DISPLAY 'INVALID CARD COD
-   'E NUMBER'.
    GO TO START.
MOVE-A. IF CD-CODE NOT EQUAL TO TEST DISPLAY 'SORRY, CARD NOT IN
    'CORRECT SEQUENCE'.
```

PROGRAM B

```
.          SOURCE STATEMENT
      MOVE SPACES TO PRINT-LINE.
      MOVE '257-' TO XCHANGE.
      MOVE TELEPHONE TO NUMBER.
      MOVE NAME TO DATA-FIELD.
      WRITE PRINT-LINE AFTER 2 LINES.
      MOVE SPACES TO PRINT-LINE.
      MOVE INST TO DATA-FIELD.
      WRITE PRINT-LINE AFTER 1 LINES.
      MOVE SPACES TO PRINT-LINE.
      COMPUTE COUNTER = COUNTER + 3.
      COMPUTE TEST = 2.
      IF COUNTER EQUAL  TO 50 OR COUNTER GREATER THAN 50 GO TO
      BEGIN, OTHERWISE GO TO START.
MOVE-B. IF CARD-CODE NOT EQUAL TO TEST DISPLAY 'SORRY, BUT CARD 1
-     'S NOT IN CORRECT SEQUENCE'.
      MOVE SPACES TO PRINT-LINE.
      MOVE ST-ADD TO DATA-FIELD.
      WRITE PRINT-LINE AFTER 1 LINES.
      MOVE SPACES TO PRINT-LINE.
      MOVE PLACE TO DATA-FIELD.
      WRITE PRINT-LINE AFTER 1 LINES.
      COMPUTE COUNTER = COUNTER + 2.
      MOVE 1 TO TEST.
      IF COUNTER EQUAL TO 50 OR COUNTER GREATER THAN 50 GO TO BEGIN
      OTHERWISE GO TO START.
FINISH. CLOSE CARD-IN, DIRECTORY.
      STOP RUN.
```

PROGRAM B

cont.

257-4269 ALBERTI, DINO A.
LA POLYTECHNIC INST
P. C. BOX 607
JONESBORO, LOUISIANA 71251

257-2697 ALPER, BRUCE H.
FLORIDA ATLANTIC UNIVERSITY
100 ROYAL PALM WAY
BOCA RATON, FLORIDA 33432

257-4866 AMBLER, MARY ELIZABETH
THE LINDENWOOD COLLEGES
929 ROBERT PLACE
KIRKWOOD, MISSOURI 63122

257-3872 ARCHER, DAVID
CLEVELAND STATE COMM COLL
1100 20 ST NW
CLEVELAND. TENNESSEE 37311

257-4061 BROWN, HUGH A.
BELMONT COLLEGE
BELMONT COLLEGE
NASHVILLE, TENNESSEE 37203

257-3586 CARRAWAY, EDWARD E.
WICHITA STATE UNIVERSITY
1547 N. YALE BLVD.,
WICHITA, KANS. 67208

257- CARTER, JOHN M.
MISSISSIPPI STATE UNIVERSITY
P.O. BOX 5346
STATE COLLEGE, MISS. 39762

257-3468 DRAKE, MAYO
LSU MED SCH IN SHREVEPORT
3756 RICHMOND AVENUE
SHREVEPORT, LOUISIANA 71104

257-4334 DYSON, SAM A.
LOUISIANA TECH UNIVERSITY
2 WESTWOOD HILLS
RUSTON, LOUISIANA 71270

257-3183 FERRARA,MARK M
NEWARK STATE COLLEGE
25 MANOR DRIVE
NEWARK,NEW JERSEY 07106

PRINTOUT B

257-2481 GATLIN, ROLAND D.
MISS. STATE UNIVERSITY
P. O. BOX 863
STATE COLLEGE, MISS. 39759

257-4592 GIBSON, DENNIS A
UNIVERSITY OF SOUTHWESTERN LA
P O BOX
PERRY LA 70575

257-4787 GRAHAM, SANDRA D.
FT. LEWIS COLLEGE
840 PLYMOUTH DR. BOX 202
DURANGO,COLORADO 81301

257-4214 GREAVES, LANDON
SOUTHEASTERN LA. COLLEGE
P.O. 302 COLLEGE STATION
HAMMOND LOUISIANA 70401

257-3545 GUTHRIE, GERRY D.
OHIO STATE UNIVERSITY
RESC. CTR. 1314 KINNEAR RD.
COLUMBUS, OHIO 43212

257-2778 KENNEDY, JOHN P.
GEORGIA TECH
1308 VALLEY VIEW RD.
DUNWOODY, GEORGIA 30338

257-4194 MC DONALD, BAXTER JR.
NORTHEAST LA. STATE COLLEGE
2207 GALE ST
MONROE, LA. 71201

257- MINITER,JOHN J.
TEXAS WOMAN,S UNIVERSITY
13511 HEARTSIDE PLACE
DALLAS, TEXAS 75234

257-3974 POUNCY, MITCHELL L.
SOUTHERN UNIVERSITY
BOX 10031 SOUTHERN BRANCH
BATON ROUGE, LOUISIANA 70813

257-4034 TAYLOR, GERRY M
ARKANSAS STATE UNIVERSITY
BOX 1017
STATE UNIVERSITY, ARK 72467

PRINTOUT B
cont.

257-4034 TAYLOR, MYRA
ARKANSAS STATE UNIVERSITY
BOX 1C17
STATE UNIVERSITY, ARK 72467

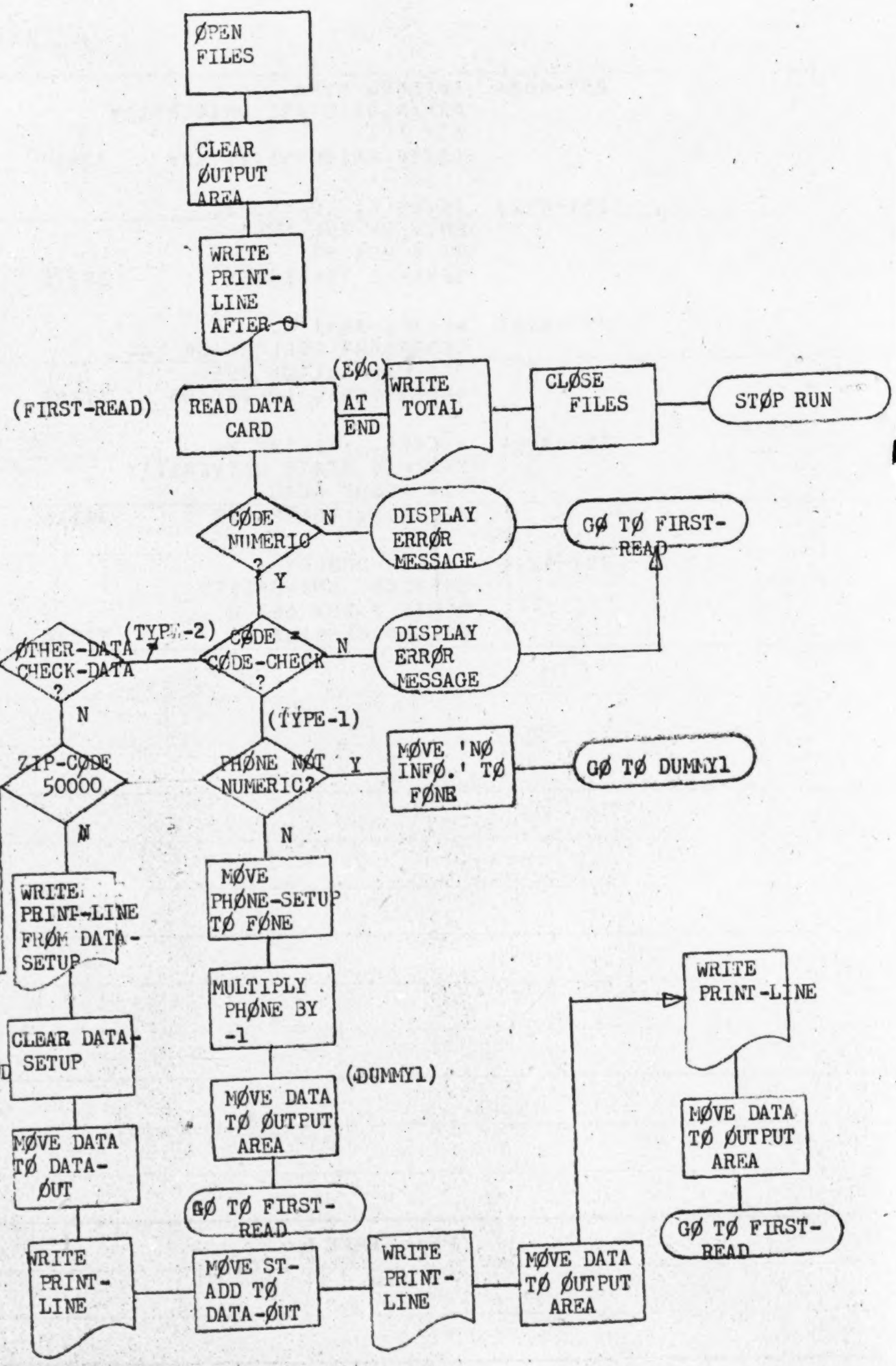
257-4123 TRIBBLE, EDWARD J.
UNIV OF THE SOUTH
RT 1 BOX 57
SEWANEE TENNESSEE 37375

257-4787 WHITE, ANNA H.
CENTENARY COLLEGE OF LA.
231 CARROLLTON AVE.
SHREVEPORT, LOUISIANA 71105

257-3084 WICKER, WILLIAM W.
MEMPHIS STATE UNIVERSITY
924 MOSBY ROAD
MEMPHIS, TENNESSEE 38116

257-4214 YATES, DUDLEY
STETSON UNIVERSITY
ROUTE 2 BOX 667 D
DELAND FLORIDA 32720

PRINTOUT B
cont.


ØPEN FILES
CLEAR ØUTPUT AREA
WRITE PRINT-LINE AFTER 0
(FIRST-READ)
READ DATA CARD
(EØC) AT END
WRITE TOTAL
CLØSE FILES
STØP RUN
CØDE NUMERIC ?
N
DISPLAY ERRØR MESSAGE
GØ TØ FIRST-READ
Y
DISPLAY ERRØR MESSAGE
Y
ØTHER-DATA CHECK-DATA ?
(TYPE-2)
CØDE = CØDE-CHECK ?
N
N
(TYPE-1)
MØVE 1 TØ CØDE-CHECK
Y
ZIP-CODE 50000
PHØNE NØT NUMERIC?
Y
MØVE 'NØ INFØ.' TØ FØNE
GØ TØ DUMMY1
GØ TØ FIRST-READ
N
N
WRITE PRINT-LINE FRØM DATA-SETUP
MØVE PHØNE-SETUP TØ FØNE
INCREMENT CØDE-CHECK & MISS-WEST
MULTIPLY PHØNE BY -1
CLEAR DATA-SETUP
GØ TØ FIRST-READ
(DUMMY1)
MØVE DATA TØ ØUTPUT AREA
MØVE DATA TØ DATA-ØUT
GØ TØ FIRST-READ
WRITE PRINT-LINE
MØVE ST-ADD TØ DATA-ØUT
WRITE PRINT-LINE
MØVE DATA TØ ØUTPUT AREA
WRITE PRINT-LINE
MØVE DATA TØ ØUTPUT AREA
GØ TØ FIRST-READ

Flowchart C

Program C

NE NO.	SEQ. NO.	SOURCE STATEMENT	AMBLER MARY	CBD CL3-5
1	00104	IDENTIFICATION DIVISION.		
2	00105	PROGRAM-ID. 'LA102'.		
3	00106	AUTHOR. MARY ELIZABETH AMBLER.		
4	00107	REMARKS. LAI PARTICIPANTS LIST.		
5	001071	THE LINDENWOOD COLLEGES.		
6	00108	ENVIRONMENT DIVISION.		
7	00109	INPUT-OUTPUT SECTION.		
8	00110	FILE-CONTROL.		
9	00111	SELECT CARD ASSIGN TO 'SYS012' UNIT-RECORD 2540R.		
10	00112	SELECT PRINTER ASSIGN TO 'SYS014' UNIT-RECORD 1403.		
11	00113	DATA DIVISION.		
12	00114	FILE SECTION.		
13	00115	FD PRINTER LABEL RECORDS ARE OMITTED RECORDING MODE IS F		
14	00116	RECORD CONTAINS 133 CHARACTERS DATA RECORD IS PRINT-LINE.		
15	00117	01 PRINT-LINE.		
16	00118	02 FILLER PICTURE X(133).		
17	00119	FD CARD LABEL RECORDS ARE OMITTED RECORDING MODE IS F		
18	00120	RECORD CONTAINS 80 CHARACTERS DATA RECORDS ARE NAME-CARD,		
19		ADD-CARD.		
20		01 NAME-CARD.		
21	00201	02 NAME PICTURE X(30).		
22	00202	02 INSTITUTION PICTURE X(30).		
23	00203	02 OTHER-DATA.		
24	00204	03 SEX PICTURE X.		
25	00205	03 PART PICTURE X.		
26	00206	03 ROOM PICTURE XXX.		
27	00207	02 PHONE PICTURE 9999.		
28	00208	02 FILLER PICTURE X(10).		
29	00209	02 KODE PICTURE 9.		
30	00210	01 ADD-CARD.		
31	00211	02 ST-ADD PICTURE X(30).		
32	00212	02 CITY-STATE PICTURE X(25).		
33	00213	02 ZIP-CODE PICTURE XXXXX.		
34	00214	02 FILLER PICTURE X(20).		
35	00215	WORKING-STORAGE SECTION.		
36	00216	77 CODE-CHECK PICTURE 9 VALUE IS 1.		
37	00217	77 CHECK-DATA PICTURE XXXXX.		
38	00218	77 PHONE-SETUP PICTURE XXXXXXXXX VALUE IS 'PHONE 257'.		
39	00219	77 INSTI-S PICTURE X(30).		
40	00220	77 MISS-WEST PICTURE 99 VALUE IS 0.		
41	00301	01 DATA-SETUP.		
42	00302	02 FILLER PICTURE X(10) VALUE IS SPACES.		
43	00303	02 FONE PICTURE XXXXXXXXX.		
44	00304	02 PHONE-OUT PICTURE -----.		
45	00305	02 FILLER PICTURE XXX VALUE IS SPACES.		
46	00306	02 DATA-OUT.		
47	00307	03 FIRST-PART PICTURE X(25).		
48	00308	03 ZIP-OUT PICTURE XXXXX.		
49	00309	02 FILLER PICTURE X(76) VALUE IS SPACES.		
50	003091	01 COUNTER-SETUP.		
51	003092	02 FILLER PICTURE X VALUE IS SPACES.		
52	003093	02 THER-A PICTURE X(9) VALUE IS 'THERE ARE'.		
53	00394	02 NO-W PICTURE ZZ9.		
54	00396	02 R-SENT PICTURE X(48) VALUE IS ' PARTICIPANTS THAT LIVE		
55	90336	'WEST OF THE MISSISSIPPI.'.		
S 56	00497	02 FILLER PICTURE X(72) VALUE IS SPACES.		

Program C (cont.)

```
LINE NO. SEQ. NO.          SOURCE STATEMENT

  S  57   00310  PROCEDURE DIVISION.
     58   00311       OPEN INPUT CARD OUTPUT PRINTER.
     59               MOVE SPACES TO PRINT-LINE.
     60               WRITE PRINT-LINE AFTER ADVANCING 0 LINES.
     61   00312  FIRST-READ.
     62   00313       READ CARD AT END GO TO EOC.
     63   00314       IF KODE IS NOT NUMERIC THEN DISPLAY 'CARD CODE ERROR'
     64   00315       GO TO FIRST-READ.
     65   00316       IF KODE IS EQUAL TO CODE-CHECK GO TO TYPE-1, TYPE-2
     66   00317       DEPENDING ON KODE OTHERWISE DISPLAY 'CARD OUT OF SEQUENCE'.
     67   00318       GO TO FIRST-READ.
     68   00319  TYPE-1.
     69   00320       IF PHONE IS NOT NUMERIC MOVE 'NO INFO.'TO FONE GO TO DUMMY1.
     70   00401       MOVE PHONE-SETUP TO FONE. MULTIPLY PHONE BY -1 GIVING
     71   00402       PHONE-OUT.
     72   00403  DUMMY1.
     73   00494       MOVE NAME TO DATA-OUT.
     74   90405       MOVE INSTITUTION TO INSTI-S.
  S  75   00406       MOVE 2 TO CODE-CHECK.
     76   00407       MOVE OTHER-DATA TO CHECK-DATA.
     77   00408       GO TO FIRST-READ.
     78   00409  TYPE-2.
     79   00410       IF OTHER-DATA IS NOT EQUAL TO CHECK-DATA THEN DISPLAY 'SORRY
     80   00411       'BUT THE SECOND CARD DID NOT MATCH THE FIRST CARD.' MOVE 1 T
     81   00412       CODE-CHECK GO TO FIRST-READ.
     82   00413       IF ZIP-CODE IS NOT LESS THAN '50000' MOVE 1 TO CODE-CHECK AD
     83   00414       1 TO MISS-WEST GO TO FIRST-READ.
     84   00415       WRITE PRINT-LINE FROM DATA-SETUP AFTER ADVANCING 2 LINES.
     85   00416       MOVE SPACES TO DATA-SETUP.
     86   00417       MOVE INSTI-S TO DATA-OUT.
     87   00418       WRITE PRINT-LINE FROM DATA-SETUP AFTER ADVANCING 1 LINES.
     88   00419       MOVE ST-ADD TO DATA-OUT.
     89   00420       WRITE PRINT-LINE FROM DATA-SETUP AFTER ADVANCING 1 LINES.
     90   00501       MOVE CITY-STATE TO DATA-OUT.
     91   00502       MOVE ZIP-CODE TO ZIP-OUT.
     92   00503       WRITE PRINT-LINE FROM DATA-SETUP AFTER ADVANCING 1 LINES.
     93   00504       MOVE MISS-WEST TO NO-W.
     94   00505       MOVE COUNTER-SETUP TO PRINT-LINE.
     95   00507       MOVE 1 TO CODE-CHECK. GO TO FIRST-READ.
  S  96   00507  EOC. WRITE PRINT-LINE FROM COUNTER-SETUP AFTER ADVANCING 2 LINES
     97   00508       CLOSE CARD PRINTER.    STOP RUN.
```

Printout C

PHONE 257-2697
ALPER, BRUCE H.
FLORIDA ATLANTIC UNIVERSITY
100 ROYAL PALM WAY
BOCA RATON, FLORIDA 33432

PHONE 257-3872
ARCHER, DAVID
CLEVELAND STATE COMM COLL
1100 20 ST NW
CLEVELAND TENNESSEE 37311

PHONE 257-4061
BROWN, HUGH A.
BELMONT COLLEGE
BELMONT COLLEGE
NASHVILLE, TENNESSEE 37203

NO INFO. -3586
CARTER, JOHN M.
MISSISSIPPI STATE UNIVERSITY
P.O. BOX 5346
STATE COLLEGE, MISS. 39762

PHONE 257-3183
FERRARA,MARK M
NEWARK STATE COLLEGE
25 MANOR DRIVE
NEWARK,NEW JERSEY 07106

PHONE 257-2481
GATLIN, ROLAND D.
MISS. STATE UNIVERSITY
P. O. BOX 863
STATE COLLEGE, MISS. 39759

PHONE 257-3545
GUTHRIE, GERRY D.
OHIO STATE UNIVERSITY
RESC. CTR. 1314 KINNEAR RD.
COLUMBUS, OHIO 43212

PHONE 257-2778
KENNEDY, JOHN P.
GEORGIA TECH
1308 VALLEY VIEW RD.
DUNWOODY, GEORGIA 30338

PHONE 257-4123
TRIBBLE, EDWARD J.
UNIV OF THE SOUTH
RT 1 BOX 57
SEWANEE TENNESSEE 37375

PHONE 257-3084
WICKER, WILLIAM W.
MEMPHIS STATE UNIVERSITY
924 MOSBY ROAD
MEMPHIS, TENNESSEE 38116

PHONE 257-4214
YATES, DUDLEY
STETSON UNIVERSITY
ROUTE 2 BOX 667 D
DELAND FLORIDA 32720

THERE ARE 14 PARTICIPANTS THAT LIVEWEST OF THE MISSISSIPPI.

HOMEWORK FOR PROGRAMMING - SESSION # 1

Punch a set of cards with the following information about yourself.

Card	Card Column(s)	Description
# 1	1 - 30	NAME
	31 - 60	INSTITUTION
	61	SEX (M or F)
	62	Participation Code (1 faculty, 2 student)
	63 - 65	Dorm Room
	66 - 69	Telephone
	70 - 79	GARBAGE
	80	Card Code (1)
# 2	1 - 30	P O or Street Address
	31 - 55	City and State
	56 - 60	ZIP CODE
	61	SEX (M or F)
	62	Participation Code (1 faculty, 2 student)
	63 - 65	Dorm Room
	66 - 79	GARBAGE
	80	Card Code (2)

These cards will be used in the Homework assignment for Programming Session # 2.

COBOL EXERCISE NO. 1

1. Name the divisions in a COBOL Program.

2. What does 'FD' mean?

3. What is the relation of a data record to a file?

4. Name three COBOL verbs.

5. The 01 level is written starting in which margin?

6. In what division of a COBOL Program are the actual processing instructions written? (NOTE: Where is the work done?)

7. What does 1/0 mean?

8. A card reader (2540R) is what class of device?
(Input or Output)

9. Write a COBOL picture to fit the following numeric item: 12484

10. Write a COBOL picture to fit the following Alpha/numeric item:
L. A. Institute

11. What input picture would you use for the following numbers:

123.6	Punched as*	1236
1.148	Punched as	1148
444.1	Punched as	4441

* The decimal is not punched

12. On what topic (already covered) would you like to have additional help?

FIFTH DAY, June 19

CATALOGING GROUP PROCEEDINGS

By

JOHN P. KENNEDY

L. A. I. CATALOGING GROUP

A. Members of the group described the libraries with which they were affiliated.

B. A system design problem was defined.
   1. Members of the group agreed on characteristics, size and processing volumes for a hypothetical library for which a system was to be designed.
   2. It was specified that the IBM 360 configuration available in the Louisiana Tech Computer Center was available for the use of the library and that the Marc tapes were being received by the Library.
   3. Members of the class were instructed to do the general design of a system to produce catalog cards from the MARC records.
   4. Group members raised the possibility of storing the MARC file and the library's catalog on direct access storage devices. As a first step in designing the system, group members were instructed to determine the average record size required and then to estimate the number of 2311 disk drives (the direct access device available on the Louisiana Tech system) which would be required to store the entire catalog on line at one time.

C. The MARC Project was described.
   1. The history and objectives of the MARC program at the Library of Congress were reviewed.
   2. The MARC II format was described. The use of variable length fields, delimiters, subfields codes and the record directory were introduced. The great flexibility of the MARC format was emphasized.

D. Group members' solution on disk storage estimates were examined. Through this review it was brought out that:
   1. In addition to the characters required for the contents of the data fields determined to be essential, it was necessary to allow for tags, delimiters, control codes and indexes to the file.
   2. The characteristics of the hardware device available might influence storage efficiency. The possibility of storing eight 453-character physical records on each 3625 character track of the disk was considered.
   3. The economic impracticality of this type of storage for most libraries was brought out. Estimates of the number of disk drives which would be required for storing minimum data for the libraries represented were in the 15 to 50 range.

E. Possibilities for storing large catalog files on other direct access storage devices at centers serving groups of libraries were considered.

F. The group developed a flowchart for a program to convert records on a MARC tape from the modified ASCII code to EBCDIC code, to print the converted records, and to write a new output file containing the converted records. New COBOL concepts introduced were the REDEFINES clause, the use of tables and subscripts, and the use of loops within a loop.

Prior to this session the instructor coded the program which had been flowcharted during the previous session.

G. Group members' system designs for the problem presented during the first session were presented and discussed.

H. The system flowcharts for catalog production at Georgia Tech were examined.

I. Discussion led to the conclusion that libraries of the sizes and nature represented in the group could not economically automate their catalog production at present but that they could benefit through the services of automated processing centers.

J. Group members keypunched the program which had been flowcharted in the previous session.

K. Evening session in the Computer Center
The program which had been keypunched during the afternoon session was tested and debugged. The flowchart of this program is presented as Figure A. The program listing is presented as Figure B, and a page of the printed output is presented as Figure C. This program is not presented as a model for the most efficient means of converting MARC records but as a class-developed program.

L. The converted MARC records printed by the class program were examined. The MARC II format was reviewed and studied in greater detail by analyzing the printed records.

M. The group flowcharted a second program to select specified records from the tape output of the previous program and to print a list of the short titles of the selected records. Records to be selected were to be determined from a card file with the selected LC card numbers punched in the first twelve columns and formatted in the same way as LC card numbers on the MARC tapes. New programming concepts introduced were file processing logic, the use of PERFORMed subroutines and the use of program switches. It was emphasized that the subroutines developed to locate the title field in the MARC records and to move the short title to the print area could be used for locating and moving other data items by supplying different tags to the first subroutine. The flowchart and DATA DIVISION coding developed for this program are presented as Figures D and E.

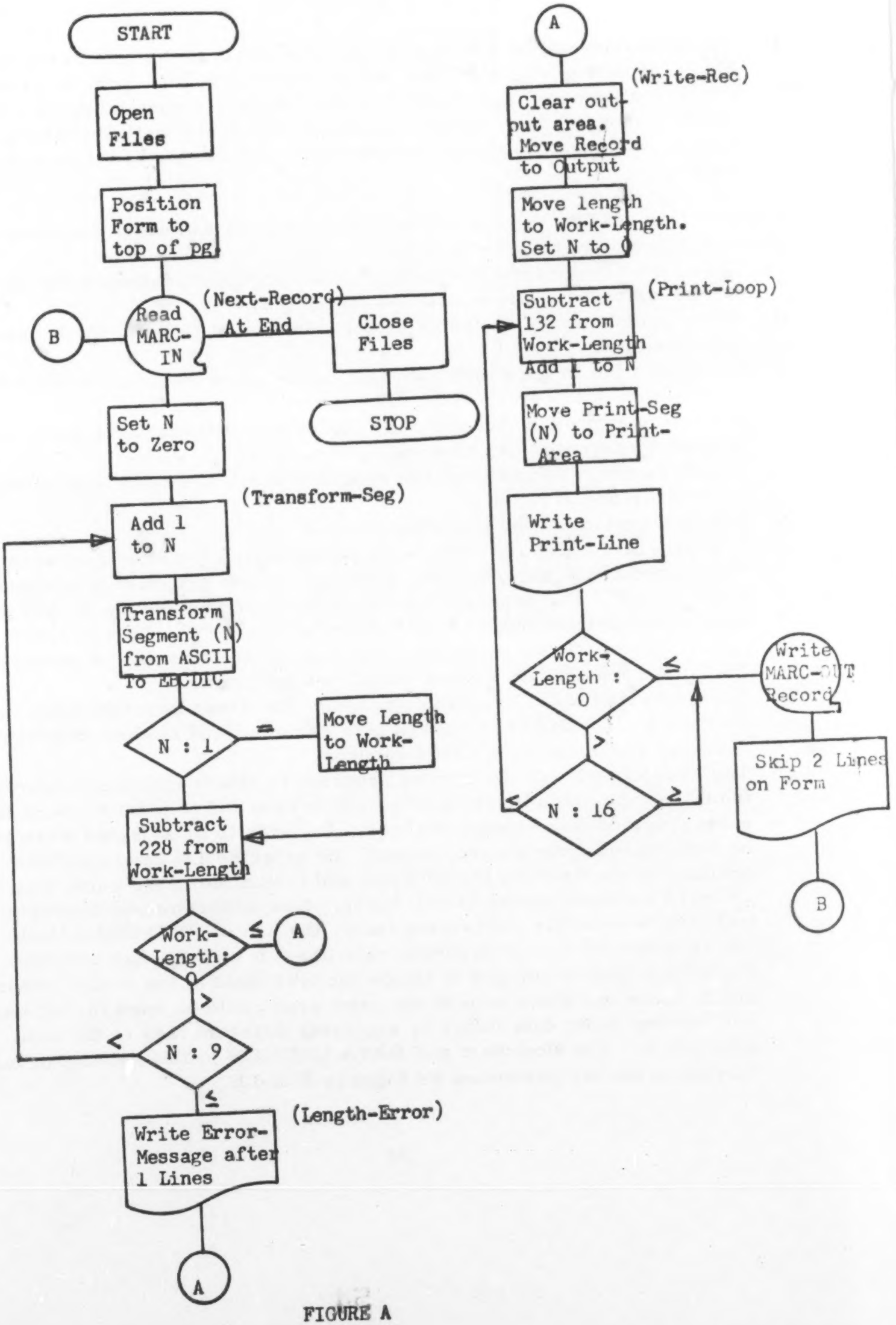

START
Open Files
Position Form to top of pg.
B
Read MARC-IN
(Next-Record)
At End
Close Files
STOP
Set N to Zero
(Transform-Seg)
Add 1 to N
Transform Segment (N) from ASCII to EBCDIC
N : 1
=
Move Length to Work-Length
Subtract 228 from Work-Length
Work-Length: 0
≤
A
>
<
N : 9
≤
(Length-Error)
Write Error-Message after 1 Lines
A
A
(Write-Rec)
Clear out-put area. Move Record to Output
Move length to Work-Length. Set N to 0
(Print-Loop)
Subtract 132 from Work-Length Add 1 to N
Move Print-Seg (N) to Print-Area
Write Print-Line
Work-Length : 0
≤
Write MARC-OUT Record
>
<
N : 16
≥
Skip 2 Lines on Form
B

FIGURE A

```
SEQ. NO.          SOURCE STATEMENT                                  CBD CL3-5 06/26/

 00104  IDENTIFICATION DIVISION.
 00105  PROGRAM-ID.  'TRNSMARC'.
 00106  AUTHOR. CATALOGING GROUP.
 00107  DATE-COMPILED.
 00108  REMARKS. READS MARC RECORDS. TRANSFORMS CHARACTER CODES FROM
 00109      THE  MARC VERSION OF ASCII TO EBCDIC FOR IBM 360. WRITES
 00110      TRANSFORMED RECORDS ON TAPE AND PRINTS A PROOFLISTING.
 00111  ENVIRONMENT DIVISION.
 00112  INPUT-OUTPUT SECTION.
 00113  FILE-CONTROL.
 00114      SELECT MARC-IN ASSIGN TO 'SYS015' UTILITY 2400.
 000141     SELECT MARC-OUT ASSIGN TO 'SYS016' UTILITY 2400.
 00115      SELECT PRTR-FILE ASSIGN TO 'SYS014' UNIT-RECORD 1403.
 00117  DATA DIVISION.
 00118  FILE SECTION.
 00119  FD MARC-IN
 00120      LABEL RECORDS ARE OMITTED
 00121      RECORDING MODE IS U
 00122      RECORD CONTAINS 50 TO 2052 CHARACTERS
 00123      DATA RECORDS ARE MARC-REC MARC-REC2.
        01  MARC-REC.
            02 REC-SEG  PICTURE X(228)  OCCURS 9 TIMES.
        01  MARC-REC2.
            02 LENGTH   PICTURE 9(5).
            02 FILLER   PICTURE X(2047).
        FD  MARC-OUT
            LABEL RECORDS ARE OMITTED
            RECORDING MODE IS V
            RECORD CONTAINS 50 TO 2112 CHARACTERS
            DATA RECORD IS MARC-OUT-REC.
        01  MARC-OUT-REC.
            02 DATA-MARC PICTURE X OCCURS 2052 TIMES DEPENDING ON LENGTH.
        FD PRTR-FILE
            LABEL RECORDS ARE OMITTED
            RECORDING MODE IS F
            RECORD CONTAINS 133 CHARACTERS
            DATA RECORD IS PRINT-LINE.
        01  PRINT-LINE.
            02 CC   PICTURE X.
            C2 PRINT-AREA  PICTURE X(80).
            02 FILLER PICTURE X(52).
 00301  WORKING-STORAGE SECTION.
 00302  77  WORK-LENGTH PICTURE S9(5).
 00303  77  N   PICTURE 99.
 003031 01 ASCII.
 003032     02 P1 PICTURE X(120) VALUE '
 003033-    '                .<(+|&          $*)/        ,%_>?          :
 003034-    '                                '.
 003035     02 P2 PICTURE X(28) VALUE  ' STUVWXYZ      0123456789    '.
 003036 01  EBCDIC.
 003037     02 PT1  PICTURE X(118)  VALUE
 003038     '#¬/$ ¬"#$%&¬();*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVW
 003039-    'XYZ¬>¬ABCDEFGHIJKLMNOPQRSTUVWXYZ¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬'.
            02 PT2 PICTURE X(30) VALUE                                  '¬|
      -     '||||||||||||||||||||||||||||||'.
        01 MARC-REC-SETUP.
```

FIGURE B

```
SEQ. NO.          SOURCE STATEMENT

            02 MARC-OUT-SEG PICTURE X(80)  OCCURS 26 TIMES.
 00307  PROCEDURE DIVISION.
 00308      OPEN INPUT MARC-IN  WITH NO REWIND
                               OUTPUT MARC-OUT PRTR-FILE.
 003081     MOVE SPACES TO PRINT-LINE. WRITE PRINT-LINE AFTER 0.
 00309  NEXT-RECORD.
            MOVE SPACES TO MARC-REC.
 00310      READ MARC-IN AT END GO TO DONE.
 00311      MOVE ZERO TO N.
 00312  TRANSFORM-SEG.
 00313      ADD 1 TO N.
 003140     TRANSFORM REC-SEG (N) FROM ASCII TO EBCDIC.
 004        IF N = 1 MOVE LENGTH TO WORK-LENGTH.
 004        SUBTRACT 228 FROM WORK-LENGTH.
 004        IF WORK-LENGTH > ZERO NEXT SENTENCE
 004          ELSE GO TO WRITE-REC.
 004        IF N < 9 GO TO TRANSFORM-SEG.
 004    LENGTH-ERROR.
 004        MOVE ' LENGTH ERROR IN FOLLOWING RECORD.' TO PRINT-AREA.
 004        WRITE PRINT-LINE AFTER 2.
 004    WRITE-REC.
            MOVE SPACES TO MARC-REC-SETUP.
 004        MOVE SPACES TO MARC-OUT-REC.
 004        MOVE MARC-REC TO MARC-OUT-REC.
            MOVE MARC-REC TO MARC-REC-SETUP.
 004        MOVE LENGTH TO WORK-LENGTH.
 004        MOVE ZERO TO N.
 004    PRINT-LOOP.
 004        SUBTRACT 80  FROM WORK-LENGTH.
 004        ADD 1 TO N.
 004        MOVE MARC-OUT-SEG (N) TO PRINT-AREA.
 004        WRITE PRINT-LINE AFTER 1.
 004        IF WORK-LENGTH > ZERO NEXT SENTENCE
 004          ELSE GO TO FINISH-REC.
 00501      IF N < 26 GO TO PRINT-LOOP.
 00512  FINISH-REC.
 00513      WRITE MARC-OUT-REC.
 00504      MOVE SPACES TO PRINT-LINE.
 00505      WRITE PRINT-LINE AFTER 2.
 00506      GO TO NEXT-RECORD.
 00507  DONE.
 00508      CLOSE MARC-IN MARC-OUT PRTR-FILE.
 00509      STOP RUN.
```

FIGURE B continued

SUBSTITUTION TABLE

PRINTING CHARACTER	SUBSTITUTED FOR
$	Delimiter Character
/	Field Terminator
#	Escape Character
|	All Diacriticals
"	Apostrophe or Single Quote
¬	End of Record Character and all other Characters not available on the Print Chain

FIGURE C

```
C084CNAM  22CC193       CC100130CCCCCC08CC41CC013050001400054082CC08000682450C81
007626CCC38001573CCCC3100195SCC0151CC2265C4002SCC3776500045CC4066500058CC45165C
C43CC5C97CCC035CC5527100C6CCC587/   69013480 /691C27S1969    NYUA     B    1010
 ENG  /0 $ABF38$B.H8/  $A15C/0 $AHUMAN ACTICN:$BCONCEPTUAL AND EMPIRICAL ISSUES
$CEDITED BY THEODORE MISCHEL./C $ANEW YORK,$BACADEMIC PRESS,$C1969./  $AXI, 293
P.$BILLUS.$C24 CM./  $ATHE PAPERS ARE THE RESULT OF A WORKING CONFERENCE HELD A
 THE CENTER FOR CONTINUING EDUCATICN OF THE UNIVERSITY OF CHICAGC, SEPT. 27-OCT
1, 1967./  $AINCLUDES BIBLIOGRAPHIES./ O$APSYCHCLOGY$XADDRESSES, ESSAYS, LECTU
ES./ O$AMOTIVATION (PSYCHOLOGY)$XADDRESSES, ESSAYS, LECTURES./ O$AEMOTIONS$XADD
ESSES, ESSAYS, LECTURES./1O$AMISCHEL, THEODORE,$D1925-$EED./1O$ACHICAGC.$BUNIVE
SITY.$BCENTER FOR CONTINUING EDUCATION.¬ääääää
```

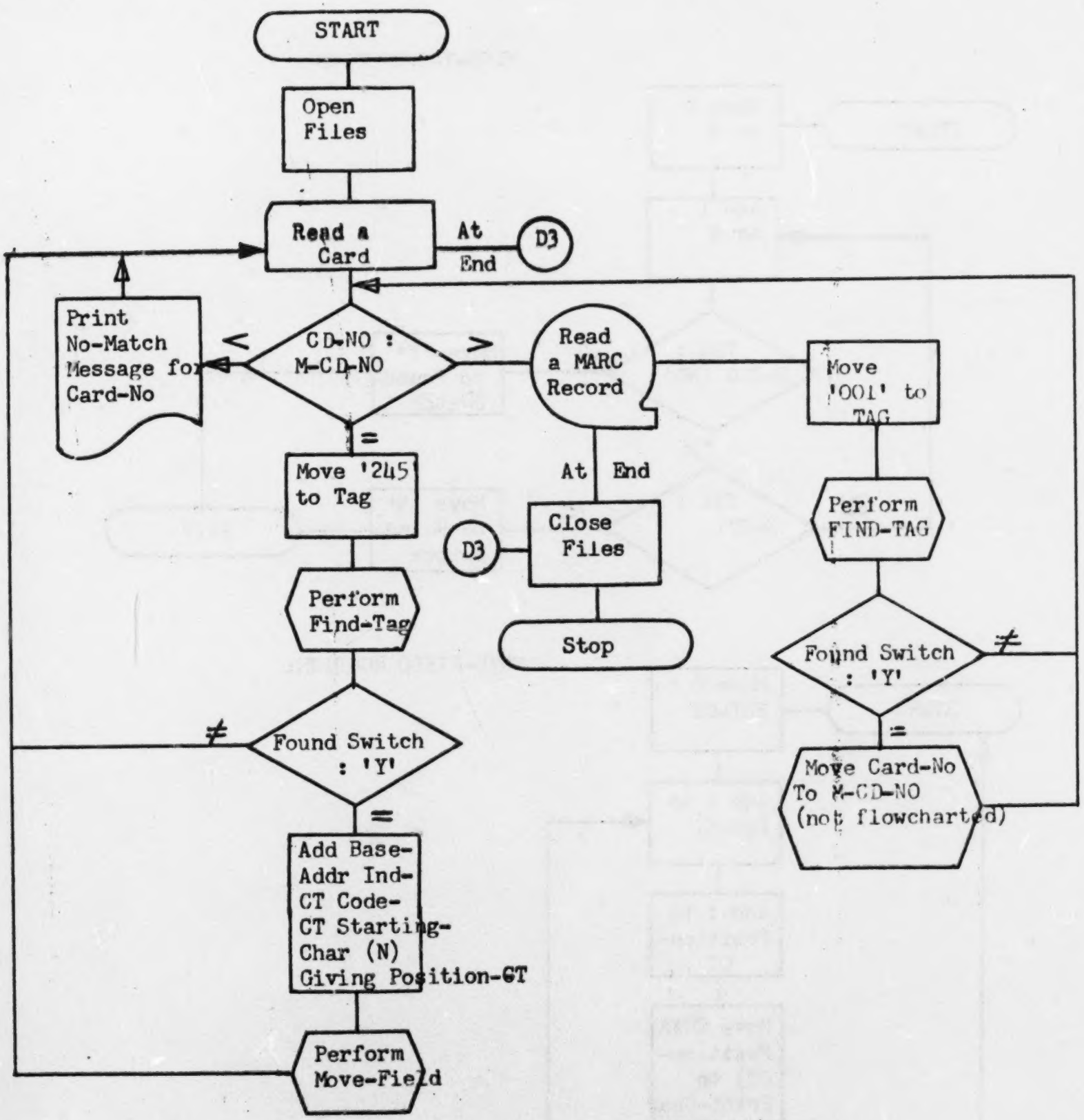
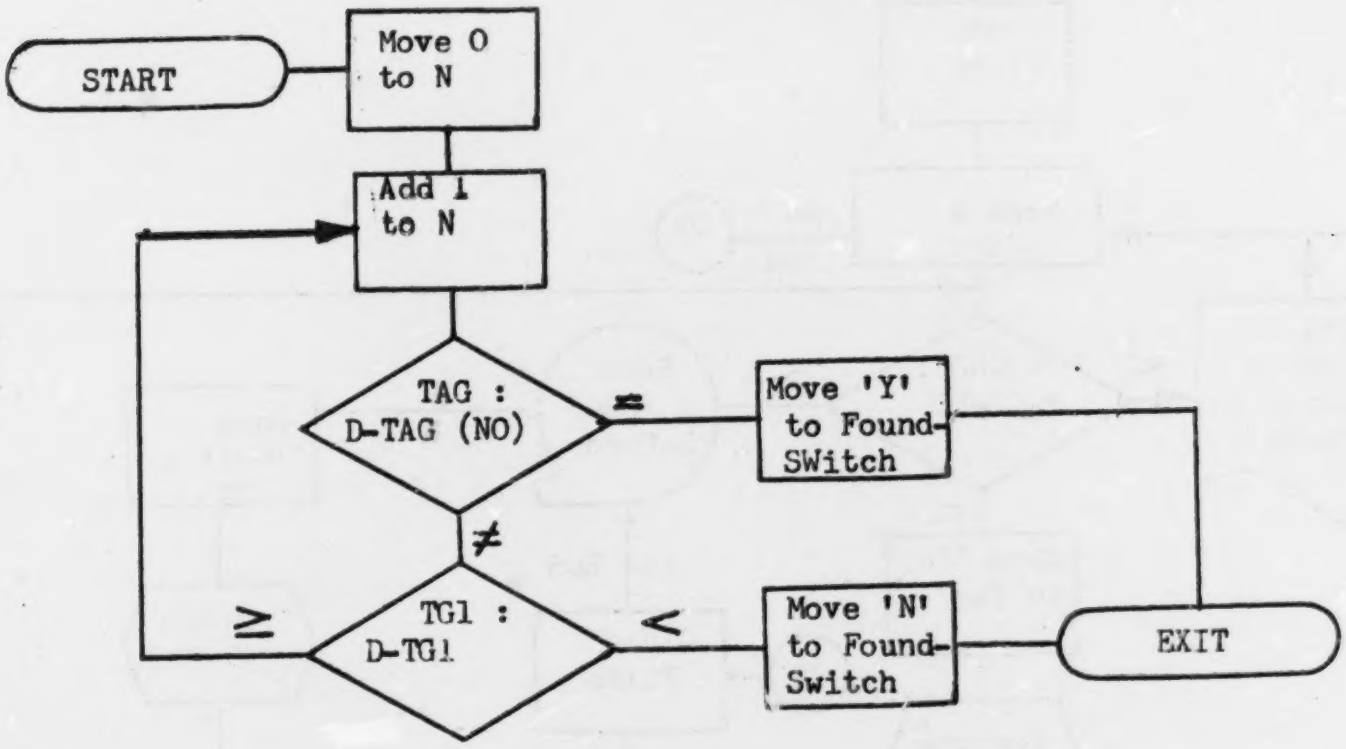

START
Open Files
Read a Card
At End
D3
Print No-Match Message for Card-No
CD-NO : M-CD-NO
<
=
>
Move '245' to Tag
Perform Find-Tag
Found Switch : 'Y'
≠
=
Add Base-Addr Ind-CT Code-CT Starting-Char (N) Giving Position-CT
Perform Move-Field
Read a MARC Record
At End
D3
Close Files
Stop
Move '001' to TAG
Perform FIND-TAG
Found Switch : 'Y'
≠
=
Move Card-No To M-CD-NO
(not flowcharted)

FIGURE D

FIND-TAG ROUTINE:



MOVE-FIELD ROUTINE:

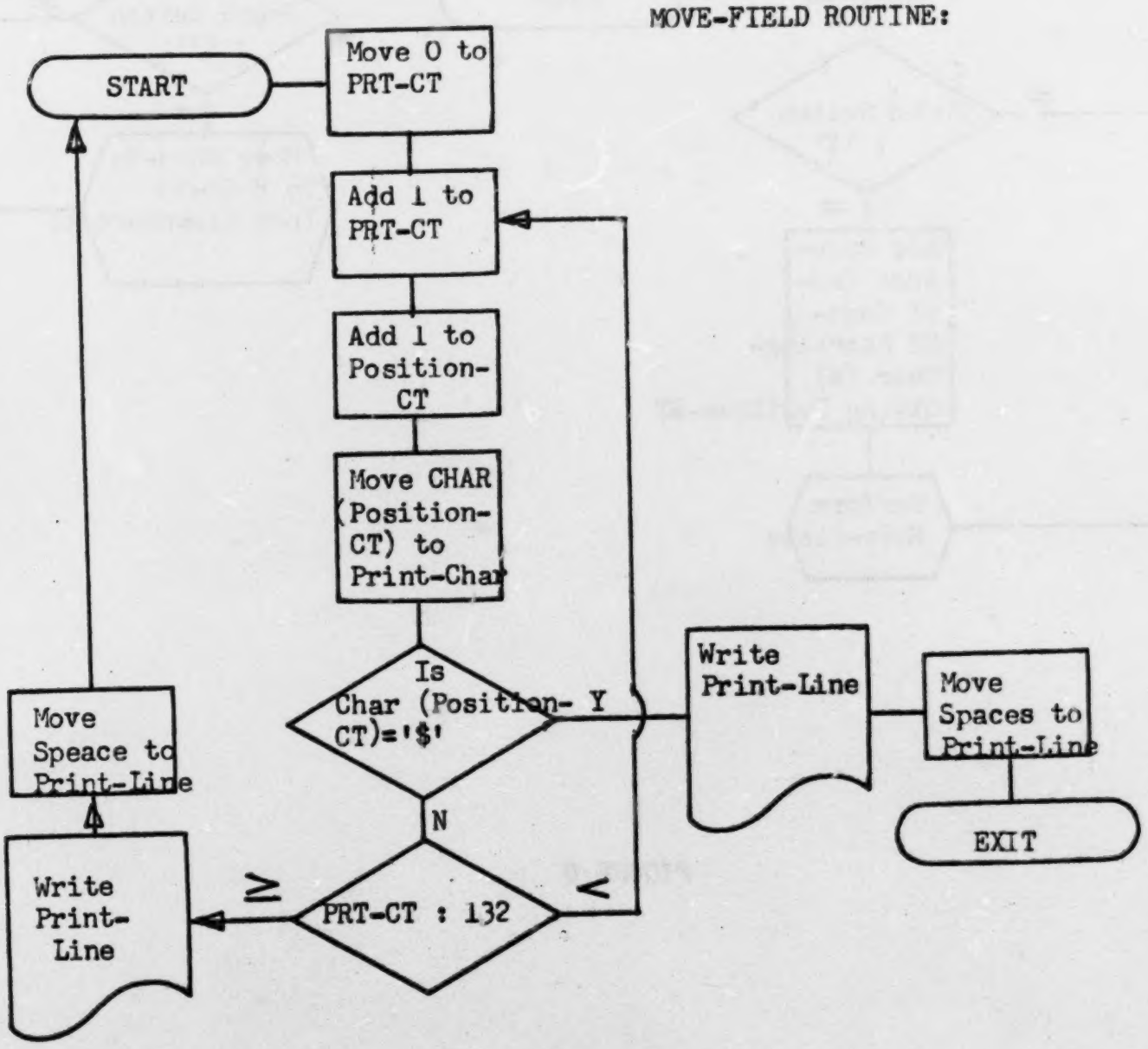


 FIGURE D continued

FIGURE E

SELECTIVE TITLE LIST

Cataloging Class

```
DATA DIVISION.
FILE SECTION.
FD  MARC-FILE
    ----------
    DATA RECORDS ARE MARC-REC MARC-REC2.
01  MARC-REC.
    02 LEADER.
       03 FILLER            PICTURE X(10).
       03 IND-CT            PICTURE 9.
       03 CODE-CT           PICTURE 9.
       03  BASE-ADDR        PICTURE 99999.
       03  FILLER           PICTURE X(7).
    02 DIRECTORY-ENTRY          OCCURS 168.
       03 D-TAG.
          04 D-TG1          PICTURE 9.
          04 D-TG2-3        PICTURE 99.
       03 LENGTH            PICTURE 9999.
       03 STARTING-CHAR     PICTURE 99999.
    02 FILLER               PICTURE X(8).
01  MARC-REC2.
    02 CHAR                 PICTURE X  OCCURS 2048.

FD  PRINTER-FILE
    ------------
    DATA RECORD IS PRINT-LINE.
01  PRINT-LINE.
    02 CC  PICTURE X.
    02  PRINT-AREA.
       03 PRINT-CHAR PICTURE X  OCCURS 132.

FD  CARD-FILE
    ---------
    DATA RECORD IS SELECT-CARD.
01  SELECT-CARD.
    02 CD-NO  PICTURE X(12).
    02 FILLER PICTURE X(68).
```

```
WORKING-STORAGE SECTION.
77  N  PICTURE 9999.
77  POSITION-CT PICTURE 9999.
77  PRT-CT PICTURE 999.
77 FOUND-SWITCH PICTURE X.
01  TAG.
    02 TG1            PICTURE 9.
    02 TG2-3          PICTURE 99.
01  M-CD-NO.
    02 CD-NO-CHAR  PICTURE X  OCCURS 12.
```

FIGURE E continued

CIRCULATION GROUP PROCEEDINGS

By

GERRY D. GUTHRIE

THE CIRCULATION FACULTY GROUP PROBLEM

On Friday, June 19, the four participants of the circulation faculty group problem met for their first four hour session. I began by presenting the basic circulation problem (see page 63 .) I then presented a short lecture describing a typical circulation system showing each program and how it fit into the total system. The participants were then asked to select one of the four computer programs as their individual problem.

Work began immediately on the creation of a forms design. This is an essential step in the participant's solution of the problem in that he is required to analyze what pieces of information should appear on his particular report and what he would have to do in his computer program to get this information.

Three four hour sessions were held on Tuesday, Wednesday and Thursday of the following week. These sessions were essentially work sessions with the participants working individually on their program with assistance from the instructor when necessary. Questions that arose which were of common interest to the group would be presented to the group as a whole and a short discussion would follow. Evening sessions were held in the dormitory and later on in the week at the Computer Center for actual testing and debugging.

At the conclusion of the institute two of the participants had successfully completed their circulation problem, one of the participants had a completed error-free compile listing that had not achieved a successful test, and the fourth participant had not successfully completed an error-free compilation. The final step of the group problem, which would have involved a discussion of their problems and their solutions, was not held because of lack of time. The participants without exception worked very hard on this problem and spent many long hours working on their individual programs. The results of the group problem were quite surprising considering the short amount of time the participants had at their disposal. In general the participants felt that working on their own individual computer programs gave them a much greater understanding of the complexities involved in library automation.

CIRCULATION PROBLEM

1. Your problem is based on a typical automated circulation system. The four computer programs listed below are an essential part of an integrated system. One program will be assigned to each participant.

Essentially the problem will involve (1) designing a form for the computer output which will display all information required, (2) write a flow chart to show how your program will logically accomplish this task, and (3) test and debug your program so that it will accurately produce the required report.

The four problems (i.e. programs) are as follows:

a. Daily Circulation Report Run
b. Overdue Notice Print Run
c. Hold Notice Print Run
d. Fine Notice Print Run

A description of these programs and how they fit into the circulation system will be described in a lecture given during the first class session.

2. All programs use a common data base which is a tape file. See the "File Description" for the contents of the file.

3. Assumptions:
   a. All transactions have been posted to the file and it is ready to produce the weekly reports.
   b. All data on the file is valid and does not contain errors.
   c. The report date is 2/15/70.

4. The basic problem can be expanded to include more advanced concepts if time permits. These will be assigned according to individual progress.

5. At the end of the problem each participant will be expected to complete a
   a. Forms Layout
   b. Flow Chart
   c. Cobol Compile Listing
   d. Printed Report
6. On Thursday, June 25 from 1:00 - 5:00 be prepared to present your solution to the circulation group. We will discuss:
   a. Forms design
   b. Problems encountered in programming
   c. Clerical operations at <u>your</u> library which could be eliminated if your program were implemented.

FILE DESCRIPTION

The following describes the characteristics of the test file used in the circulation exercise:

1. Label records are standard.
2. Records are 127 characters long blocked at 10.
3. Data fields:

FIELD NAME	SIZE	VALUES
Media Code	1	M - Monograph S - Serial X - Special
Location Code	1	1 - Undergraduate 2 - Hospital 3 - Law School 4 - Engineering 5 - Main Library
Call Number	12	Alpha-numeric
Date Charged	6	Month-day-year from 01-01-70 to 02-20-70
Date Due	6	Month-day-year from 01-15-70 to 03-05-70
Status	1	C - In circulation D - Discharged R - Recall H - Hold
Main Entry	15	Alpha-numeric
Title	20	Alpha-numeric
Patron I. D. No.	9	Numeric
User Name	15	Alpha-numeric
Address 1	15	Alpha-numeric
Address 2	15	Alpha-numeric
Patron Type	1	F - Faculty S - Student C - Courtesy Card
Holdings	10	Alpha-numeric (Indicates volume and copy)

CIRCULATION PROBLEM

INDIVIDUAL PROGRAMS

1. Overdue Notices

   Using the printer lay-out forms, design a form for an overdue notice which will be mailed to library patrons. Using data elements from the file, determine which fields are to be printed on the notice.
   It will be necessary to select only those records on the file which are actually overdue.
   Use your own experience at your library in designing the form and writing the program.

2. Fine Due Notices

   Using the printer lay-out forms, design a form for a fine due notice which will be mailed to library patrons. Using data elements from the file, determine which fields are to be printed on the notice.
   It will be necessary to select only those records on the file which have been discharged and were overdue.
   Use your own experience at your library to design the form and write the program.

3. Hold Return Notice

   Using the printer lay-out forms, design a form for a hold return notice which will be mailed to library patrons. Using data elements from the file, determine which fields are to be printed on the notice.
   It will be necessary to select only those records on the file which have been discharged with a hold.
   Use your own experience at your library to design the form and write the program.

4. Circulation Listing

   Using the printer lay-out forms, design a form for a daily circulation listing which will be given to the circulation department. Using data elements from the file, determine which fields are to be printed on the report.
   It will be necessary to select only those records on the file which would be of interest to the circulation desk.
   Use your own experience at your library to design the form and write the program.

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ACQUISITIONS GROUP PROCEEDINGS

By

BRUCE H. ALPER

ACQUISITIONS GROUP PROJECT

The Acquisitions group undertook three separate projects. The first was the writing of a program by each group member to list information contained in the FAU L.A.I.S. data card. The problem statement (problem No. 1) and three of the programs written are included. All members of the group succeeded in producing working programs.

The second project was the design of an order follow-up Sub-System for the FAU system. The problem statement (problem No. 2) and the resultant system design documentation are included. The design of the Sub-System is that of the students and the wording of the documentation is also their own. It is the feeling of this instructor that this project was extremely successful and the resultant system designing is of very high quality.

The final project was the re-design of the FAU L.A.I.S. to suit the needs of the institutions the students represented. A complete system package was developed and is included in this document. The system speaks for itself; there is little doubt that it will meet the design criteria and function properly.

ACQUISITIONS PROBLEM NO. 1

PROGRAM OBJECTIVE: Produce a list of paid items for student and faculty use. Printout size is to be limited to an 8 1/2 by 11 inch size to allow placing it in a standard 3 ring binder. This list will be a weekly accessions list.

INPUT FILE: Punched card. Format defined by page 19 of LAIS Documentation.

OUTPUT FILE: Printer. Use up to 80 print positions. (The printer has 10 print positions to the inch, horizontally.)
NOTE: The computer printer prints 6 lines to the inch vertically.

REQUIRED SYSTEM DESIGN:

1. Define fields to be listed, and their format in the printer list.
2. Flowchart the program. Be sure to provide for the following:
   A. Serial items do not use the Author field. All of the first 40 card positions are used for the title.
   B. Do not list postage transaction.
   C. Provide some method of identifying serial items.
   D. Approval plan items should also be uniquely identified.
3. Decide in what sequence you want the items listed.
4. Provide the program with a page overflow routine and use your institutions name in the page heading.

```
LINE NO. SEQ. NO.          SOURCE STATEMENT                    D.ARCHER      CBD CL

      1    001     IDENTIFICATION DIVISION.
S     2    001     PROGRAM-ID. 'LAI3'.
S     3    001     AUTHOR. DRA.
S     4    001     REMARKS. WEEKLY ACQUISITIONS LIST
S     5    001     ENVIRONMENT DIVISION.
S     6    001     INPUT-OUTPUT SECTION.
S     7    001     FILE-CONTROL.
S     8    001         SELECT CARD
S     9    001         ASSIGN TO 'SYS012' UNIT-RECORD 2540R.
S    10    001         SELECT PRINTER ASSIGN TO 'SYS014' UNIT-RECORD 1403.
S    11    001     DATA DIVISION.
      12    001     FILE SECTION.
S    13    001     FD  CARD LABEL RECORDS ARE OMITTED, RECORDING MODE IS F,
S    14    001         RECORD CONTAINS 80 CHARACTERS, DATA RECORD IS TRAN.
S    15    001     01  TRAN.
S    16    001         02 FIRST-40.
S    17    001         03 AUTHOR PICTURE X(16).
S    18    001         03 TITLE PICTURE X(24).
S    19    001         02 FILLER PICTURE X(18).
S    20    001         02 COPIES PICTURE XX.
S    21    001         02 FUND PICTURE XXXX.
S    22    001         02 FILLER PICTURE X(9).
S    23    001         02 PAID PICTURE 9999V99.
S    24    001         02 FILLER PICTURE X.
      25    002     FD  PRINTER LABEL RECORDS ARE OMITTED, RECORDING MODE IS F,
S    26    002         RECORD CONTAINS 86 CHARACTERS, DATA RECORDS ARE HDR,
S    27    002         DATALINE.
S    28    002     01 HDR.
S    29    002         02 FILLER PICTURE X(23).
S    30    002         02 SCHL-N PICTURE X(40).
S    31    002         02 FILLER PICTURE X(4).
S    32    002         02 DATE-OUT PICTURE X(8).
S    33    002         02 FILLER PICTURE XX.
S    34    002         02 PG-OT PICTURE X(5).
S    35    002         02 PAGE-OUT PICTURE ZZZ9.
S    36    002     01 DATALINE.
S    37    002         02 FILLER PICTURE X.
S    38    002         02 AUTH-TTL.
S    39    002         03 TL-OT PICTURE X(24).
S    40    002         03 FILLER PICTURE X(5).
S    41    002         03 AU-OT PICTURE X(16).
S    42    002         02 FILLER PICTURE X(5).
S    43    002         02 FND-OT PICTURE XXXX.
S    44    002         02 FILLER PICTURE X(5).
S    45    002         02 P-OT PICTURE ZZZ9.99.
S    46    002         02 DOLTL REDEFINES P-OT PICTURE X(7).
S    47    002         02 FILLER PICTURE X(19).
      48    003     WORKING-STORAGE SECTION.
S    49    003     77  LINCT PICTURE 99 VALUE IS 60.
S    50    003     77  PCT PICTURE 9(4) VALUE IS 0.
S    51    003     77  P-DATE PICTURE X(8).
S    52    003     77  UPSI PICTURE X.
S    53    003     PROCEDURE DIVISION.
      54    003         OPEN INPUT CARD OUTPUT PRINTER.
S    55    003         INCLUDE 'CBL0001'.
      56 *              ENTER LINKAGE.
```

```
LINE NO. SEQ. NO.          SOURCE STATEMENT

     57 *              CALL 'GETDAT' USING P-DATE , UPSI.
     58 *              ENTER COBOL.
  S  59    003       READ-CARD.
  S  60    003           READ CARD AT END GO TO EOF.
  S  61    003           IF COPIES = 'PO' GO TO READ-CARD.
  S  62    003           IF LINCT > 55 GO TO OFLOW.
  S  63    003       OFLOW-RTN. MOVE SPACES TO HDR.
  S  64    003           IF COPIES = 'PR' GO TO SERIAL.
  S  65    003           MOVE TITLE TO TL-OT.
  S  66    003           MOVE AUTHOR TO AU-OT.
  S  67    003       SERIAL-RTN.
  S  68    003           IF FUND = '0100' MOVE 'AVPL' TO FND-OT ELSE MOVE FUND TO
  S  69    003           FND-OT.
  S  70    003           MOVE PAID TO P-OT.
  S  71    003           WRITE HDR AFTER 1.
  S  72    003           ADD 1 TO LINCT.
  S  73    003           GO TO READ-CARD.
     74    004       SERIAL.
  S  75    004           MOVE FIRST-40 TO AUTH-TTL.
  S  76    004           GO TO SERIAL-RTN.
  S  77    004       OFLOW.
  S  78    004           MOVE SPACES TO HDR.
  S  79    004           MOVE '      CLEVELAND STATE COMMUNITY COLLEGE' TO SCHL-N.
  S  80    004           WRITE HDR AFTER 0. MOVE SPACES TO HDR.
  S  81    004           MOVE '         WEEKLY ACQUISITIONS LIST' TO SCHL-N.
  S  82    004           MOVE P-DATE TO DATE-OUT. ADD 1 TO PCT.
  S  83    004           MOVE PCT TO PG-OT. MOVE 'PAGE ' TO PG-OT.
  S  84    004           MOVE PCT TO PAGE-OUT.
  S  85    004           WRITE HDR AFTER 1. MOVE SPACES TO HDR.
  S  86    004           MOVE 'TITLE' TO TL-OT.
  S  87    004           MOVE 'AUTHOR' TO AU-OT.
  S  88    004           MOVE 'FUND' TO FND-OT.
  S  89    004           MOVE ' COST' TO DOLTL.
  S  90    004           WRITE HDR AFTER 1. MOVE SPACES TO HDR.
  S  91    004           WRITE HDR AFTER 1.
  S  92    004           MOVE 0 TO LINCT.
  S  93    004           GO TO OFLOW-RTN.
  S  94    004       EOF. CLOSE CARD PRINTER.
  S  95    002           STOP RUN.
```

CLEVELAND STATE COMMUNITY COLLEGE
WEEKLY ACQUISITIONS LIST

TITLE	AUTHOR	FUND	COST
DATRIX REF OVER 10	DATRIX	0000	5.80
OPTCL FUND OF UNDERWATER	MCNEIL G T	6000	5.00
MODERN TRUST FORMS V.1 1969 & SUPPL		1100	37.50
AMER STRING TCHRS ASSN 1970 MEMBERSHIP		0300	10.00
ANNUAL INST ON EST PLANNING V 1-3		1000	85.00
BERKELEY TRIBE 1/70-12/70		0300	6.00
BIBLIOGRAPHCL SOC OF AMER 1970 MEMB		0300	10.00
BROADCASTING 1970 YEARBOOK		0300	11.50
VOL 1-9 1955-64	DRAMA REVIEW	3800	202.50
FAIRCHILD TROPICAL GARDEN 1/70-12/70		0300	3.00
FLA STATE HORTICULTURAL SOC MEMB 1969		0300	6.00
JAPAN STATISTICAL YRBK 1969		0500	16.00
MARKETING & THE LAW 1/70-12/70		1300	36.00
NATL INST FOR ARCHITECTURAL ED 1969 YRBK		0300	5.00
ORPHEUS 1/70-12/70		0300	6.00
RICKENBACKER REPORT 5/1/70-5/1/71		1300	108.00
UTILITIES LAW REPORTS 6/70-6/71		0300	295.00
NATL SOC FOR STDY OF EDUC YRBK 1967 PT 1		0300	4.95
NEGOTIATIONS MGMT SERV MEM REN 6/70-6/71		0300	55.00
LIB OF CONGRESS NATL UNION CATALOG 69-72		0300	76.00
BANK AUDITING & ACCNTG REPT 5/70-5/71		0300	28.00
HANDBUCK PHYSIK BD 25 TL 2C SUP PR		0300	26.40
AMER MATHEMATICAL SOC TRANSL 2 NO.86		0300	10.80
RADIOPHYSICS & QUANTUM ELECT V 11 1968		0300	160.00
DOWNFALL OF DERVISHES	BENNETT E N	3400	10.50
READINGS IN HUMAN DEVL	BERNARD H W	2200	4.95
WHEN THE COCK CROWS	BIRKELAND T	2100	3.49
MAKING OF MID SCHLS	BROWN E E	2400	18.50
THE SACRED PIPE	BROWN J E	5100	5.36
SUMMERFOLK	BURN D	2100	3.29
LAND & WILDLIFE OF AFRIC	CARR A	2100	6.34
THE REPTILES	CARR A	2100	6.34
THE MAMMALS	CARRINGTON R	2100	6.34
HORATIO	CLYMER E	2100	3.25
GROWING YEARS V 3	COIT M L	2100	6.69
SWEEP WESTWARD	COIT M L	2100	6.69
SEL CHARACTER OF AMER SE	COUNTS G S	2400	6.00
JOE & THE SNOW	DE PAOLA T	2100	4.25
MGMT INFO SYSTEM	DEARDEN J	1300	12.32
THE PRIMATES	DEVORE I	2100	6.34
WHEELS FOR A NATION	DONOVAN F	2100	6.26
HEALTH & DISEASE	DUBOS R	2100	6.34
DEVL OF LABOR SURPLUS EC	FEI J	5200	7.65
GEO WASHINGTON BREAKFAST	FRITZ J	2100	3.49
BLACK JACK	GARFIELD L	2100	4.50
MAINTAINABILITY	GOLDMAN A S	1400	12.15
APPLIED GEOCHRONOLOGY	HAMILTON E I	6000	9.00
SUPERVISORY LEADERSHIP	HARRISON R H	2400	8.55
BASEBALL MOUSE	HOFF S	2100	3.49
READINGS ON LNG & TCHNG	HOOVER K H	2400	5.95
WELSH RURAL COMMUNITIES	JENKINS D	5100	3.15
ANTHROPOLOGISTS IN FLD	JONGMANS D G	5100	9.90
MEASUREMNT OF MODERNISM	KAHL J	5100	5.40
CONQUISTADORES	KERBY E P	2100	3.29
SEA DOGS & TRAMPS	KIRCHNER C	2100	3.29
LANGUAGE TESTING	LADO R	3500	7.88

CLEVELAND STATE COMMUNITY COLLEGE
WEEKLY ACQUISITIONS LIST 06/25/70 P/

TITLE	AUTHOR	FUND	COST
COMM & DEVELOPMENT	LAKSHMANA Y V	5100	3.96
RISE OF ROMANOVS	KLYUCHEVSKY V	AVPL	11.48
CLASSICAL RHETORIC IN EN	VICKERS B	AVPL	8.95
EFF FOREIGN LANG INSTR	SMITH G E	AVPL	8.67
COMM IN EXPANDING ORGAN	MCONMAN E	AVPL	4.40
EMMA, LADY HAMILTON	HARDWICK M	AVPL	5.68
CONFLICT & UNDERSTG IN	PLATTNER P	AVPL	2.95
THE COSSACKS	LONGWORTH P	AVPL	6.39
CONTEMPORARY JEWELRY	MORTON P G	AVPL	9.64
NOTEBKS OF T WOLFE	WOLFE T	AVPL	27.54
LIVES OF W BENTON	HYMAN S	AVPL	9.18
SCENE OF CHANGE	WEAVER W	AVPL	5.36
AUTHORITY & ADDICTION	BRILL L	AVPL	13.08
URBAN CHALL TO PSYCHIATR	KOLB L C	AVPL	14.54
GENRL SYST THEORY & PSYC	GRAY W	AVPL	14.54
BOOK OF MUSICAL DOCUMNTS	NETTL P	AVPL	15.00
CLIMATE VEGETATION & MAN	HADLOW L	AVPL	16.00
BEHAVRL REPERTOIRE OF ST	BERTRAND M	AVPL	14.05
CIVIL DISOBEDIENCE	THOREAU H D	AVPL	10.00
GODS AND GAMES	MILLER D L	AVPL	4.25
HURRICANES	TANNEHILL I R	AVPL	11.50
PSYCH FOR PEDIATRICIAN	FINCH S M	AVPL	6.89
DIVORCED MOTHER	MINDLEY C	AVPL	6.38
BOUND TO EXILE	EDWARDES M	AVPL	7.30
OF HUMAN INTERACTION	LUFT J	AVPL	4.54
TOLKIEN CRITICISM	WEST R C	AVPL	4.25
NETHERLANDISH PAINTERS	BERNT W	AVPL	34.43
ARCHITECTURE IN NO GHANA	PRUSSIN L	AVPL	8.22
SOUTH AND THE NATION	WATTERS P	AVPL	5.68
FOR A NEW AMERICA	WEINSTEIN J	AVPL	9.18
SCIENCE FICTION IN CINEM	BAXTER J	AVPL	2.45
VETERINARY HELMINTHOLOGY	DUNN A M	AVPL	17.00
BOOKS FOR JR COLL LIB	PIRIE J W	AVPL	38.50
FACTRY UNDER ELMS	ARMSTRONG J B	AVPL	11.48
INTRO TO MVMT EDUC	KIRCHNER G	AVPL	3.95
NEW CURR PERSPECTIVES	PELTON B C	AVPL	2.95
CHEMISTRY OF CARBOXYLIC	PATAI S	AVPL	38.10
SOVIET HERETIC	ZAMYATIN Y	AVPL	8.72
ACCNTG FOR THE MANAGER	KEMP P S	AVPL	8.67
STUDIES IN NATURE	NARAZAKI M	AVPL	4.75
THEOLOGCL INVESTGTN V 6	RAHNER K	AVPL	7.80
ROOTS & RHYTHMS	NETTLEFORD R	AVPL	4.64
PHILOS USE OF CATEGORIES	BAER R A	AVPL	6.70
OPEN CLASSROOM	KOHL R R	AVPL	4.54
MEMOIRS OF CONSERVATIVE	DAVIDSON J C C	AVPL	7.10
READING DIFFICULTIES	DURR W K	AVPL	7.50
BALLAD AS SONG	BRONSON B H	AVPL	7.30
UPROOTED CHILDREN	COLES R	AVPL	3.95
RADICALISM, RACISM & PAR	CURRY R O	AVPL	9.69
ROOSEVELT, LEWIS, & NEW	MCFARLAND C K	AVPL	3.50
CLASS-CERAMICS & PHOTO..	BEREZHNOI A I	AVPL	36.72
FREE NITROXYL RADICALS	ROZANTSEV E G	AVPL	17.90
RADIATN FROM APERTURES	ZAKHARYEV L N	AVPL	12.00
VOLCANISM & UPPER MANTLE	GORSHKOV G S	AVPL	32.13
ADJUSTMENT	TUCKER I F	AVPL	8.24
WHITE RACISM	KOREL J	AVPL	5.68

CLEVELAND STATE COMMUNITY COLLEGE
WEEKLY ACQUISITIONS LIST

TITLE	AUTHOR	FUND	COST
CITY WITHOUT WALLS	AUDEN W H	AVPL	4.50
TOLSTOY	CHRISTIAN R F	AVPL	8.72
MELVILLE	SEELYE J	AVPL	6.78
SON OF ROYAL LANGBIRTH	HOWELLS W D	AVPL	9.64
INFO FOR MGMT DECISIONS	GOLDSCHMIDT Y	AVPL	10.66
CHARLES KEMBLE	WILLIAMSON J L	AVPL	7.30
FRENCH SOCIALISTS IN SEA	SIMMONS H G	AVPL	8.95

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INE NO. SEQ. NO.          SOURCE STATEMENT          E.J. TRIBBLE          CBD CL3-5 0

     1          IDENTIFICATION DIVISION.
     2          PROGRAM-ID. 'ACQUIS1'.
     3          AUTHOR. ETRIB.
     4          REMARKS. ACQUISITIONS PROBLEM ONE WEEKLY LIST OF PAID ACCESSIONS.
     5          ENVIRONMENT DIVISION.
     6          INPUT-OUTPUT SECTION.
     7          FILE-CONTROL.
     8              SELECT CARD ASSIGN TO 'SYS012' UNIT-RECORD 2540R.
     9              SELECT PRINTER ASSIGN TO 'SYS014' UNIT-RECORD 1403.
    10          DATA DIVISION.
    11          FILE SECTION.
    12          FD  CARD LABEL RECORDS ARE OMITTED, RECORDING MODE IS F, RECORD
    13              CONTAINS 80 CHARACTERS, DATA RECORD TRAN.
    14          01  TRAN.
    15              02 FST-40.
    16              03 AUTHOR PICTURE X(16).
    17              03 TITLE PICTURE X(24).
    18              02 FILLER PICTURE X(18).
    19              02 POST PICTURE XX.
    20              02 FUND PICTURE XXXX.
    21              02 FILLER PICTURE X(9).
    22              02 PAID PICTURE 9999V99.
    23              02 FILLER PICTURE X.
    24          FD  PRINTER LABEL RECORDS ARE OMITTED, RECORDING MODE IS F RECORD
    25              CONTAINS 86 CHARACTERS, DATA RECORDS ARE HDR, DATALINE.
    26          01  HDR.
    27              02 FILLER PICTURE X(23).
    28              02 SCHL-NAM PICTURE X(40).
    29              02 FILLER PICTURE XXXX.
    30              02 DATE-OUT PICTURE X(8).
    31              02 FILLER PICTURE XX.
    32              02 PG-OT PICTURE XXXXX.
    33              02 PAGEOT PICTURE ZZZ9.
    34          01  DATALINE.
    35              02 FILLER PICTURE X.
    36              02 AUTH-TIL.
    37              03 TL-OT PICTURE X(24).
    38              03 FILLER PICTURE XXXXX.
    39              03 AU-OT PICTURE X(16).
    40              02 FILLER PICTURE XXXXX.
    41              02 FNDOT PICTURE XXXX.
    42              02 FILLER PICTURE XXXXX.
    43              02 P-OT PICTURE ZZZ9.99.
    44              02 DOLTL REDEFINES P-OT PICTURE X(7).
    45              02 FILLER PICTURE X(19).
    46          WORKING-STORAGE SECTION.
    47          77  LINCT PICTURE 99 VALUE IS 60.
    48          77  PCT PICTURE 9(4) VALUE IS 0.
    49          77  P-DATE PICTURE X(8).
    50          77  UPSI PICTURE X.
    51          PROCEDURE DIVISION.
    52              OPEN INPUT CARD OUTPUT PRINTER.
    53              INCLUDE 'CBL0001'.
    54 *            ENTER LINKAGE.
    55 *            CALL 'GETDAT' USING P-DATE , UPSI.
    56 *            ENTER COBOL.
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LINE NO. SEQ. NO.          SOURCE STATEMENT

      57          RC.
      58              READ CARD AT END GO TO EOF.
      59              IF POST = 'PO' GO TO RC.
      60              IF LINCT > 55 GO TO OFLOW.
      61          OFLOW-RTN. MOVE SPACES TO HDR.
      62              IF POST = 'PR' GO TO SERIAL.
      63              MOVE TITLE TO TL-OT.
      64              MOVE AUTHOR TO AU-OT.
      65          SERIAL-RTN.
      66              IF FUND = ' 0100' MOVE 'APVL' TO FNDOT ELSE MOVE FUND TO
      67              FNDOT.
      68              MOVE PAID TO P-OT.
      69              WRITE HDR AFTER 1.
      70              ADD 1 TO LINCT.
      71              GO TO RC.
      72          SERIAL.
      73              MOVE FST-40 TO AUTH-TIL.
      74              GO TO SERIAL-RTN.
      75          EOF.
      76              CLOSE CARD, PRINTER. STOP RUN.
      77          OFLOW.
      78              MOVE SPACES TO HDR.
      79              MOVE '          UNIVERSITY OF THE SOUTH' TO SCHL-NAM.
      80              WRITE HDR AFTER 0. MOVE SPACES TO HDR.
      81              MOVE '        WEEKLY ACQUISITIONS LIST' TO SCHL-NAM.
      82              MOVE P-DATE TO DATE-OUT. ADD 1 TO PCT.
      83              MOVE PCT TO PAGEOT. MOVE 'PAGE ' TO PG-OT.
      84              WRITE HDR AFTER 1. MOVE SPACES TO HDR.
      85              MOVE 'TITLE' TO TL-OT. MOVE 'AUTHOR' TO AU-OT.
      86              MOVE 'FUND' TO FNDOT.
      87              MOVE ' COST' TO DOLTL.
      88              WRITE HDR AFTER 1. MOVE SPACES TO HDR.
      89              WRITE HDR AFTER 1.
      90              MOVE ZERO TO LINCT.
      91              GO TO OFLOW-RTN.
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TITLE	AUTHOR	FUND	COST
MARC MANUALS USED BY LIB	U S LIB CONG	0100	7.50
BINDING 1 PERIODICAL	DOBBS BROTHERS	1300	4.85
HANDBOOK OF SALAMANDERS	BISHOP S	4100	14.25
PICKWICK PAPERS	DICKENS C	9100	2.75
YORUBA WARFARE IN 19TH	AJAYI J F A	5100	3.60
SUBJECT CURRICULUM	ALPREN M	2200	8.50
INTERACTION ANALYSIS	AMIDAN E J	2200	4.70
MUSIC IN SECONDARY SCHLS	ANDERSON S V	9100	5.65
NEBRASKA SYMP ON MOTIV	ARNOLD W J	2200	6.26
EDUCATION, PHYS EDUC &..	ARNOLD P	9100	6.26
PHYSICS OF STRENGTH & PL	ARGON A S	6000	11.25
PATTERNS OF MAMMALIAN RE	ASDELL S A	4100	14.25
1ST PRINCIPLES OF SPEECH	AVERY D	9100	4.75
EDUC IN INDUSTRL SOC	BANTOCK G H	9100	6.00
POWER OF DECISION	BARKER R C	1400	4.46
UNIVERSE OF DR EINSTEIN	BARNETT L K	9100	5.40
AMER PUBL SCHOOL FIN	BARR W M	9100	6.75
LITERARY HIST OF ENGLAND	BAUGH A C	9100	12.83
SOC HIST OF EDUCATION	BECK R H	9100	4.70
PHILOSOPHIC INQUIRY	BECK L W	3700	7.55
OUTSIDERS	BECKER H S	9100	6.18
NUMERCL CALCULATNS & ALG	BECKETT R	4300	9.45
POLITICS OF SOVIET EDUC	BEREDAY G Z	3300	3.50
ABORIGINAL MAN IN AUSTRA	BERNDT R M	5100	10.20
PHYS EDUC IN PRIMARY SCH	BILBROUGH A	9100	4.50
TUDOR ENGLAND V 5	BINDOFF S T	9100	1.25
BRITAN REV OF FOREIGN V1	BIRKMAIER E	2100	11.25
PRINCE BISMARCK V 1 & 2	LOWE C	3300	7.50
ITALY UNDER MUSSOLINI	BOLITHO W	3300	3.50
SEL STUD IN INDONESIAN	BOSCH F D K	5100	5.74
PRINCIPLES OF SEC EDUC	BOSSING N L	9100	8.50
EDUC THEORY OF J J ROUSS	BOYD W	9100	9.00
IMPACT OF CHURCH UPON IT	BRAUER J C	3700	7.65
FUN & FITNESS THRU ELEM	BRYANT R	9100	8.50
BIOLOGY OF HARD TISSUES	BUDY A M	0000	11.47
MAMBU	BURRIDGE K	5100	6.00
CLASSIC AMER W/SURVEY OF	CANBY H S	9100	12.00
THE PATHANS	CAROE O	5100	7.20
STDY OF LANGUAGE	CARROLL J B	9100	4.75
BOOK OF THE COURTIER	CASTIGLIONE B	9100	2.75
GUIDE FOR ELEM SOC STUDI	CHASE W L	9100	4.95
SHAKESPEARE OF LONDON	CHUTE M G	9100	5.58
ARTS IN CLASSROOM	COLE N	9100	4.99
ART IN EDUCATION	CONANT H	9100	7.12
EDUC & LIBERTY	CONANT J B	9100	3.50
NIGHTMARE WRLD OF SHARK	COOK J	2100	3.50
MARINE BIOLOGY CULTURE	COSTLOW J D	0000	32.40
DARE SCHOOLS BLD NEW SOC	COUNTS G S	9100	4.00
WATER MGMT INNOV IN ENGL	CRAINE L E	5300	3.50
GERMANY A SELF-PORTRAIT	CRIPPEN H	3300	4.00
WHO GOVERNS	DAHL R A	9100	7.65
RUSSIA & POST-WAR EUROPE	DALLIN D	3300	3.50
TOWARD BETTER TCHNG IN	DAVIS E	9100	8.50
DIAGNOSIS & REMEDIATION	DECHANT E	9100	8.50
DIAGNOSIS & REMEDIATION	DECHANT E	9100	8.50
I VISIT THE SOVIETS	DELAFIELD E	3300	2.50

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    1   00104  IDENTIFICATION DIVISION.
    2   00105  PROGRAM-ID. 'LAI3'.
    3   00106  AUTHOR. AHW.
    4   00107  REMARKS. LAI ACQUISITIONS SEC1.
    5   00108  ENVIRONMENT DIVISION.
    6   00109  INPUT-OUTPUT SECTION.
    7   00110  FILE-CONTROL.
    8   00111      SELECT CARD ASSIGN TO 'SYS012' UNIT-RECORD 2540R.
    9   00112      SELECT PRINTER ASSIGN TO 'SYS014' UNIT-RECORD 1403.
   10   00113  DATA DIVISION.
   11   00114  FILE SECTION.
   12   00115  FD  CARD LABEL RECORDS ARE OMITTED, RECORDING MODE IS F, RECOF
   13   00116      CONTAINS 80 CHARACTERS, DATA RECORD IS TRAN.
   14   00117  01  TRAN.
   15   00118      02 FIRST-F.
   16   00119          03 AUTH PICTURE X(16).
   17   00120          03 TIL PICTURE X(24).
   18   00201      02 FILLER PICTURE X(18).
   19   00202      02 COPIES PICTURE XX.
   20   00203      02 FUND PICTURE XXXX.
   21   00204      02 FILLER PICTURE X(9).
   22   00205      02 PAID PICTURE 9999V99.
   23   00206      02 FILLER PICTURE X.
   24   00207  FD  PRINTER LABEL RECORDS ARE OMITTED RECORDING MODE IS F,
   25   00208      RECORD CONTAINS 86 CHARACTERS, DATA RECORDS ARE HDR,
   26   00209      DATA-LINE.
   27   00210  01  HDR.
   28   00211      02 FILLER PICTURE X(23).
   29   00212      02 SCHL-NAM PICTURE X(40).
   30   00213      02 FILLER PICTURE XXXX.
   31   00214      02 DATE-OUT PICTURE X(8).
   32   00215      02 FILLER PICTURE XX.
   33   00216      02 PG-OT PICTURE X(5).
   34   00217      02 PAGEOT PICTURE ZZZ9.
   35   00218  01  DATA-LINE.
   36   00219      02 FILLER PICTURE X.
   37   00220      02 AUTH-TIL.
   38   00301          03 TIL-OT PICTURE X(24).
   39   00302          03 FILLER PICTURE X(5).
   40   00303          03 AUTH-OT PICTURE X(16).
   41   00304      02  FILLER PICTURE X(5).
   42   00305      02  FUND-OT PICTURE X(4).
   43   00306      02  FILLER PICTURE X(5).
   44   00308      02  P-OT PICTURE ZZZ9.99.
S  45   00307      02  DOLTL REDEFINES P-OT PICTURE X(7).
   46   00309      02  FILLER PICTURE X(19).
   47   00401  WORKING-STORAGE SECTION.
   48   00402  77  LINCT PICTURE 99 VALUE IS 60.
   49   00403  77  PCT PICTURE 9(4) VALUE IS 0.
   50   00404  77  P-DATE PICTURE X(8).
   51   00405  77  UPSI PICTURE X.
   52   00406  PROCEDURE DIVISION.
   53   00407      OPEN INPUT CARD OUTPUT PRINTER.
   54   00408      INCLUDE 'CBL0001'.
   55 *            ENTER LINKAGE.
   56 *            CALL 'GETDAT' USING P-DATE , UPSI.
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LINE NO. SEQ. NO.          SOURCE STATEMENT

      57 *              ENTER COBOL.
      58    00409  RC.
      59    00410       READ CARD AT END GO TO EOF.
      60    00411       IF COPIES = 'PO' GO TO RC.
      61    00412       IF LINCT > 55 GO TO OFLOW.
      62    00413  OFLOW-RTN. MOVE SPACES TO HDR.
      63    00414       IF COPIES = 'PR' GO TO SERIAL.
      64    00415       MOVE TIL TO TIL-OT.
      65    00416       MOVE AUTH TO AUTH-OT.
      66    00417  SERIAL-RTN.
      67    00418       IF FUND = '0100' MOVE 'APVL' TO FUND-OT ELSE MOVE FUND
      68    00419       TO FUND-OT.
      69    00420       MOVE PAID TO P-OT.
      70    004201      WRITE HDR AFTER 1.
      71    00501       ADD 1 TO LINCT.
      72    00502       GO TO RC.
      73    00503  SERIAL.
      74    00504       MOVE FIRST-F TO AUTH-TIL.
      75    00505       GO TO SERIAL-RTN.
      76    00506  EOF. CLOSE CARD, PRINTER. STOP RUN.
      77    00507  OFLOW.
      78    00508       MOVE SPACES TO HDR.
      79    00509       MOVE '      CENTENARY COLLEGE LIBRARY' TO SCHL-NAM.
      80    00510       WRITE HDR AFTER 0. MOVE SPACES TO HDR.
      81    00511       MOVE '        WEEKLY ACQUISITIONS LIST' TO SCHL-NAM.
      82    00512       MOVE P-DATE TO DATE-OUT. ADD 1 TO PCT.
      83    00513       MOVE PCT TO PAGEOT. MOVE 'PAGE ' TO PG-OT.
      84    00514       WRITE HDR AFTER 1. MOVE SPACES TO HDR.
      85    00515       MOVE 'TITLE' TO TIL-OT.
      86    00516       MOVE 'AUTHOR' TO AUTH-OT.
      87    00517       MOVE 'FUND' TO FUND-OT.
      88    00518       MOVE ' COST' TO DOLTL.
      89    00519       WRITE HDR AFTER 1. MOVE SPACES TO HDR.
      90    00520       WRITE HDR AFTER 1.
      91    00601       MOVE ZERO TO LINCT.
      92    00602       GO TO OFLOW-RTN.
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CENTENARY COLLEGE LIBRARY
WEEKLY ACQUISITIONS LIST

TITLE	AUTHOR	FUND	COST
GEOGRAPHCL REGIONS OF NI	UDO R K	APVL	9.21
MARQUIS DE MORES	DRESDEN D	APVL	5.46
JAY TREATY	COMBS J A	APVL	7.11
CHLDRN & POLITICS	GREENSTEIN F I	APVL	5.51
IN EYES OF ANCESTORS	NASH J	APVL	11.48
NORMAN ILLUMINATN AT MT	ALEXANDER J J	APVL	15.02
WOMANS PLACE	EPSTEIN C F	APVL	6.38
IONOSPHERE & INTERACTION	KASH M A	APVL	11.02
GEOMETRCL COMBINATRL TOP	GLASER L C	APVL	3.95
REPRESENTATIVE ELEMENTS	BIGELOW M J	APVL	4.45
ESSAYS IN SHAKESPEAREAN	CALDERWOOD J L	APVL	7.70
EARTH WALK	MEREDITH W	APVL	4.50
PERSONS W/HEARING LOSS	GRIFFITH J	APVL	10.66
POLICE RECORDS SYSTEM	LEONARD V A	APVL	5.57
CHILDS CONCEPT OF MVMT &	PIAGET J	APVL	7.30
ATLAS OF MACACA MULATTA	SZEBENYI E S	APVL	22.95
CONCEPT OF PROBABILITY	LUCAS J R	APVL	5.77
RUSSIAN-ENGL PLASTICS DI	JOSSELSON H H	APVL	11.48
MATHEMATICAL SOCIOLOGY	HOLLAND J	APVL	5.97
TUDOR COMMONWEALTH	JONES W R	APVL	7.51
18TH CENTURY DRAMA	BEVIS R W	APVL	2.75
GOVT & POL OF IRELAND	CHUBB B	APVL	9.18
TIGERS HEART	HOWARTH H	APVL	4.59
SHORT INTRO TO HIST & PO	ALLEN R	APVL	5.97
LIFE & DECLINE OF AMER	STOVER J F	APVL	6.89
FICTION OF S Y AGNON	HOCHMAN B	APVL	6.38
MATERIALS & METH IN FERM	SOLOMONS G L	APVL	12.85
LOUIS XIV & 20 MILLION	GOUBERT P	APVL	5.68
ADV OF MR & MRS JIM & RO	DINE J	APVL	6.39
STUD OF LATIN AMER SOCIE	SMITH T L	APVL	1.95
HARD TIMES	TERKEL S	APVL	6.39
GABRIEL NAUDE	CLARKE J A	APVL	6.89
DRAGON COUNTRY	WILLIAMS T	APVL	5.36
DION BOUCICAULT	HOGAN R	APVL	4.13
COUNTRY EDITORS BOY	BORLAND H	APVL	4.25
UP FROM THE GHETTO	DROTNING P T	APVL	4.25
BIBLE AS LITERATURE	HENN T R	APVL	6.43
C BEN ROSS & NEW DEAL IN	MALONE M P	APVL	7.30
THOUGHTS FROM GREEKS	EPPS P H	APVL	3.50
VICTORIAN CHURCH PT 2	CHADWICK O	APVL	11.48
MASSES IN LATIN AMERICA	HOROWITZ I L	APVL	12.39
SELECTED POEMS	ABSE D	APVL	4.00
CANADA A MOD HISTORY	BREBNER J B	APVL	9.18
CAVALIER POETS	SKELTON R	APVL	6.89
NONEQUILIBRIUM FLOWS PT2	WAGENER P P	APVL	12.39
ORGANIZATN AND MANAGEMEN	KAST F E	APVL	10.61
READINGS IN SALES MGMT	BOYD H W	APVL	5.57
HIGH PRICE OF PRINCIPLES	HALL R	APVL	7.50
TERRACIDE	LINTON R M	APVL	5.68
PUBLIC WORKS	MOSES R	APVL	13.31
INTRO TO REACH IN PSYCHO	MAHER B	APVL	5.77
SARTRE & CAMUS	POLLMANN L	APVL	7.80
BERT BRECHT	HAAS W	APVL	4.59
LET NOT YOUR HEART	SEAY J	APVL	4.00
TEACHING IN BRIT PRIM SC	ROGERS V R	APVL	7.30
EXPERIMENTS IN CIVILIZAT	MOGBIN H I	APVL	7.80

CENTENARY COLLEGE LIBRARY
WEEKLY ACQUISITIONS LIST

TITLE	AUTHOR	FUND	COST
ROMANTIC QUEST & MOD QUE	DRIVER T F	APVL	6.89
COMPL PAINTINGS OF BRUEG	BRUEGEL P	APVL	5.46
LECT ON COMPLEX VARIABLE	SANSONE G	APVL	13.95
READINGS IN HIST OF EDUC	GILLETT M	APVL	5.75
MANUAL OF HISTOLOGIC STA	LUNA L G	APVL	8.72
SAPROLEGNIACEAE	COKER W C	APVL	12.60
VOCATIONAL PSYCHOLOGY	CRITES J O	APVL	13.08
MOD PRIMITIVE ARTS OF ME	OLGESBY C	APVL	8.50
FINE STRUCTURE OF BLOOD	HUHN D	APVL	16.75
MAJOR ENGL ROMANTIC POET	THORPE C D	APVL	2.50
D H LAWRENCE	MOORE H T	APVL	2.95
D H LAWRENCE	MOORT H T	APVL	2.95
SPLENDOR THAT WAS EGYPT	MURRAY M A	APVL	8.72
PROG LRNG & LANG TEACHER	HOWATT A P	APVL	2.20
HANDBK OF PALYNOLOGY	ERDTMAN G	APVL	24.75
LIVES OF WASPS & BEES	ANDREWS C	APVL	4.25
GUN THAT MADE 20S ROAR	HELMER W J	APVL	5.68
COMMON POISONOUS PLANTS	VERDCOURT B	APVL	4.40
TRADE UNIONS & INDUSTRL	KANSALOW E M	APVL	7.75
FEEDING RUSSIAN FUR TRAD	GIBSON J R	APVL	14.54
BLACK POW-WOW	JOANS T	APVL	4.50
AUGUSTE COMTE	SIMPSON G	APVL	2.25
AMERICAN HISTORY	EISENSTADT A S	APVL	5.09
STUDIES ON CONGRESS	WISE S	APVL	2.95
INNER & OUTER SPACE	RABKIN R	APVL	7.27
STRUGGLE FOR CANADIAN UN	MATHEWS R	APVL	7.50
UNJUST SOCIETY	CARDINAL H	APVL	5.95
RUSSIA & GERMANY	LAQUER W	3300	2.65
CHRIST STOPPED AT EBOLI	LEVI C	5100	5.72
WESTRIGG	LITTLEJOHN J	5100	4.50
BAYTIN JORDANIAN VILLAGE	LUTFIYYA A M	5100	9.67
THEORY OF CAPITAL	LUTZ F A	1100	11.47
DIARY IN STRICT SENSE OF	MALINOWSKI B	5100	6.12
APPR TO DYNAMIC INVEST	MARGLIN S	1100	5.40
ECON OF CAPITAL UTILIZAT	MARRIS R	1100	8.55
CASTE & RITUAL IN MALWA	MATHUR K S	5100	9.90
GOODBYE DOVE SQUARE	MCNEILL J	2100	4.50
TOLLIVER	MEANS F C	2100	3.37
GT DAY IN THE MORNING	MEANS F C	2100	3.37
SHUTTERED WINDOWS	MEANS F C	2100	3.37
REACH FOR A STAR	MEANS F C	2100	3.55
SOC ORIGINS OF DICTATORS	MOORE B	5100	8.80
DISEASE DETECTIVES	NEAL H E	2100	3.95
CAP FOR MARY ELLIS	NEWELL H	2100	3.08
THEORY OF EDUC IN U S	NOCK A J	2400	6.00
PINEAPPLE TOWN HAWAII	NORBECK E	5100	3.60
WITCH OF THE WOODS	NYBLOM H	2100	4.50
GOLDEN RIVER TO GOLDEN	PATAI R	5100	13.50
MEDITERRANEAN COUNTRYMEN	PITT-RIVERS J	5100	6.52
ANALYSIS OF SOCIAL CHNG	PONSIOEN J A	5100	5.40
GUIDING FUTURE COLL STUD	REISS J	2400	8.50
FACES IN THE CROWD	RIESMAN D	5100	13.20
STUDIES ON ASIA 1960	SAKAI R K	5100	3.52
WINDMILL HILL & AVEBURY	SMITH I	5100	15.12
MARRIAGE & SINSHIP AMONG	SPECKMANN J D	5100	9.90
HYPOTHESIS & EVIDENCE	STEPHENS W N	5600	4.70

CENTENARY COLLEGE LIBRARY
WEEKLY ACQUISITIONS LIST 06/24/70 PAGE

TITLE	AUTHOR	FUND	COST
ALAIN ROBBE-GRILLET &	STOLTZFUS B F	3500	3.96
TRANSLATIONS OF BEOWULF	TINKER C B	3400	6.00
LEASING OF INDUSTRL EQUI	VANCIL R F	1100	14.40
SELECTED WRKS OF LA FONT	WADSWORTH P	3500	1.65
FRENCH POETRY OF RENAISS	WEINBERG B	3500	1.65
CAROLINA PIRATE	WELLMAN M W	2100	3.95
THEORY OF INVESTMENT VAL	WILLIAMS J B	1100	11.25

DESIGN FOR A CLAIMS FOLLOW-UP SUB-SYSTEM

The following procedure is designed to supplement the Florida Atlantic University Library Acquisitions Information System (LAIS). The general processing flowchart on page 14 of the LAIS is to be supplemented by the accompanying flowchart representing a claims follow-up sub-system which enters the general processing flow after the "ACCOUNTING LISTING" procedure on page 14 LAIS.

The design elements of this sub-system are: separated into the necessary parameters, data available, additional data needed, and system specifications.

I. Parameters
   A. Serials are excluded from this claims sub-system.
   B. All on-order items are not designated for automatically scheduled claiming (e.g., from overseas publishers).
   C. Provisions are made for vendor responses, including status reports on the original orders and replies to claim notices.
   D. First and second notices are sent, then a final cancellation letter.
   E. The format of all notices should be in letter form.

II. Data Available
   A. Acquisition records giving author, title, publisher, order date, etc.
   B. Business office vendor files giving vendor name and appropriate address for claims correspondence.
   C. Publisher file.

The letter format is designed to have the effect of a personal letter rather than a routine machine printed form. The body of the letter may be varied as desired. Then name and address of the institution appear in letterhead form at the top of the page and the vendor name and address are positioned to fit in a window envelope when folded. The date is printed in formal correspondence style, and is positioned to appear at the top of the page, centered beneath the name of the institution.

The author or title may appear in bold face by use of a double imprint, if desired.

CLAIMS/FOLLOW-UP SUB-SYSTEM

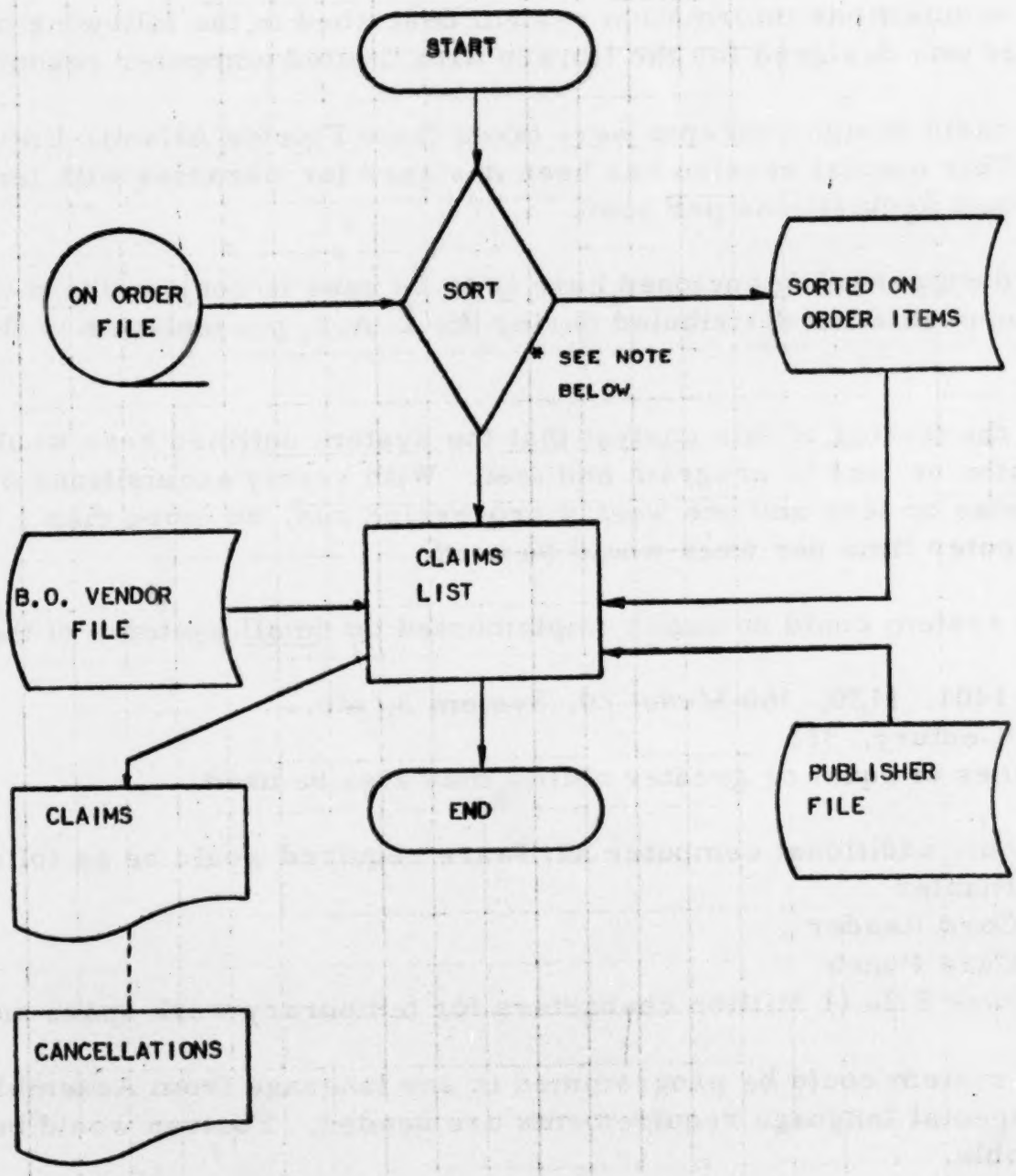
I. Problems and Requirements
   A. Not claim all items past due
   B. No Serials
   C. Two notices + cancellation
   D. Letter format for notice
   E. Indicator of Vendor response

II. Available Data
   A. LAIS Record (includes: Author, Title, Publisher, Ord. date)
   B. B. O. Vendor file with name and address
   C. Publisher file

III. New Data
   A. Claim code and claim date
   B. Non-Claim code

IV. System Specs
   A. Claims once/mth
   B. Overpunch position 52 with '-' if not to be claimed or response from Vendor.
   C. Enter response date from Vendor in paid field.
   D. Punch 'cancel' in invoice positions 65-70 if to be cancelled

L A I S ORDER FOLLOWUP SYSTEM



* NOTE: SORT SEQUENCE AS FOLLOWS

VENDOR NUMBER, ORDER DATE, TITLE

The acquisitions information system described in the following outline and flowchart was designed for the library with limited computer resources.

The basic design concepts were taken from Florida Atlantic Universities' L.A.I.S. This special version has been designed for libraries with less than 10,000 volumes acquisitions per year.

The documentation enclosed here is to be used in conjunction with the L.A.I.S. documentation distributed during the L.A.I. presentation of the FAU System.

It is the feeling of this analyst that the system outlined here would take 4 (four) months or less to program and test. With yearly acquisitions of 10,000 volumes or less and one weekly processing run, no more than 1 (one) hour of computer time per week would be used.

This system could be easily implemented on <u>small</u> systems of the following types:

IBM 1401, 1130, 360 Model 20, System 3, etc.
NCR Century, 315

Other machines of equal or greater ability may also be used.

The only additional computer hardware required would be as follows:

Printer
Card Reader
Card Punch
Disk File (1 Million characters for temporary work space only)

This system could be programmed in any language from Assembly to Cobol. No special language requirements are needed. Fortran would be quite acceptable.

This system was designed to the requirements of L.A.I. participants but is highly flexible and may easily be amplified to provide additional functions such as the 'follow-up' procedure described as problem #2. ALL the abilities of the FAU System exist in the system design displayed here.

L. A. I. ACQUISITION SYSTEM

I. Basic System Design Criteria

A. Basic Computer configuration

1. Core - 8k words (or equivalent)
2. No disk storage (for working storage only)
3. No tape storage
4. Card Reader is input device

B. Input Record Format as defined in Florida Atlantic University L. A. I. S. documentation.

C. Vendor name and address file indexed by number will be created.

D. Internal Fund file will be required.

E. The first program of the basic processing run will check ALL input data for ALL possible errors.

F. Vendor number will be limited to 4 digits. (requires change to FAU input card format).

G. Vendor table will have provision for at least 200 vendors.

H. The fund table will provide for at least 50 funds.

II. Data File Definitions

A. Fund file (table)

Note: See card format for data elements and their allocation.
This file is composed of one card for each internal fund used in the Acquisition System. The file is in sequence by fund number. The creation of fund numbers is identical to the procedure outlined in the FAU L. A. I. S. documentation.

This file provides the accounting data on a fund basis. A new file is produced by each processing run of the Acquisition System. This new file reflects the current fiscal status of the funds.

This file forms 1/3 of the input data to the system.

B. Vendor File (table)

Note: See card format for data elements and their allocation.

This file provides for the same function for vendors as the fund file does for the funds. Sequence is by vendor number.

This file provides the second third of the system data base.

C. On-order and Payment File

This file is identical to the file described in the L.A.I.S. documentation. Sequence is by title.

Coding instructions are also contained in the L.A.I.S. documentation.

III. Description of Individual Program Functions

A. Program 1... Input Edit.

1. Read and store fund and vendor tables (numbers only need be stored).
2. Verify input for errors and list detected errors on printer.
   a. Valid vendor #
   b. Valid fund #
   c. Valid price
   d. Valid order date
   e. Author and title except for postage items which MAY be left blank.
   f. Copies field
      'PO' = Postage
      'PR' = Serial
   g. If on-order item, invoice and paid amount MUST be blank.
   h. If payment, the opposite of 'g' MUST exist.
3. Save valid input on work disk.

B. Program 2... List Program

1. List any input record and summarize by the following fields:
   a. Fund #
   b. Vendor #
   c. Order date
   d. Invoice #
2. Data may be sorted in any sequence

This program is intended to be a utility listing program.

C. Program 3... Account Listing by Fund.

1. Fund table as input #1.
2. Provides line item detail of paid and ordered items.
3. Items are listed by fund # and title.
4. Starting and ending fiscal balances are listed.
5. New fund table is produced reflecting new fiscal balances.

D. Program 4... Fund balance Summary
List cards produced by program 3, (new fund table)

E. Program 5... Invoice Summary
   1. Vendor table is input.
   2. Print list of invoices by vendor with invoice and vendor totals.
   3. Create new vendor table cards. (reflecting new fiscal balances)

F. Program 6... Vendor Balance Summary

   List cards produced by program 5. (Vendor table)

FUND AND VENDOR TABLE CARDS

IBM

INTERNATIONAL BUSINESS MACHINES CORPORATION

GX24-6599-0
Printed in U.S.A.

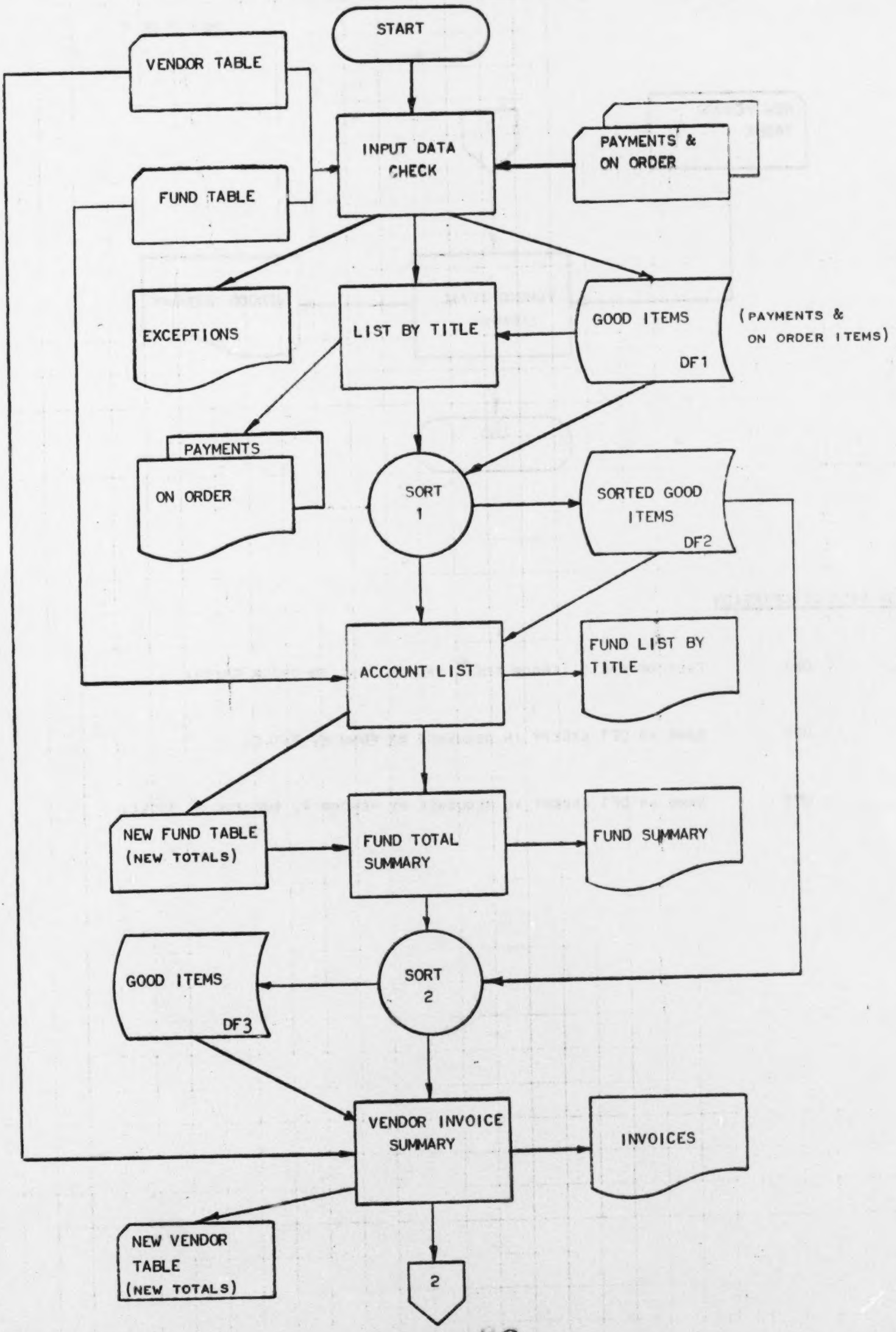
MULTIPLE-CARD LAYOUT FORM

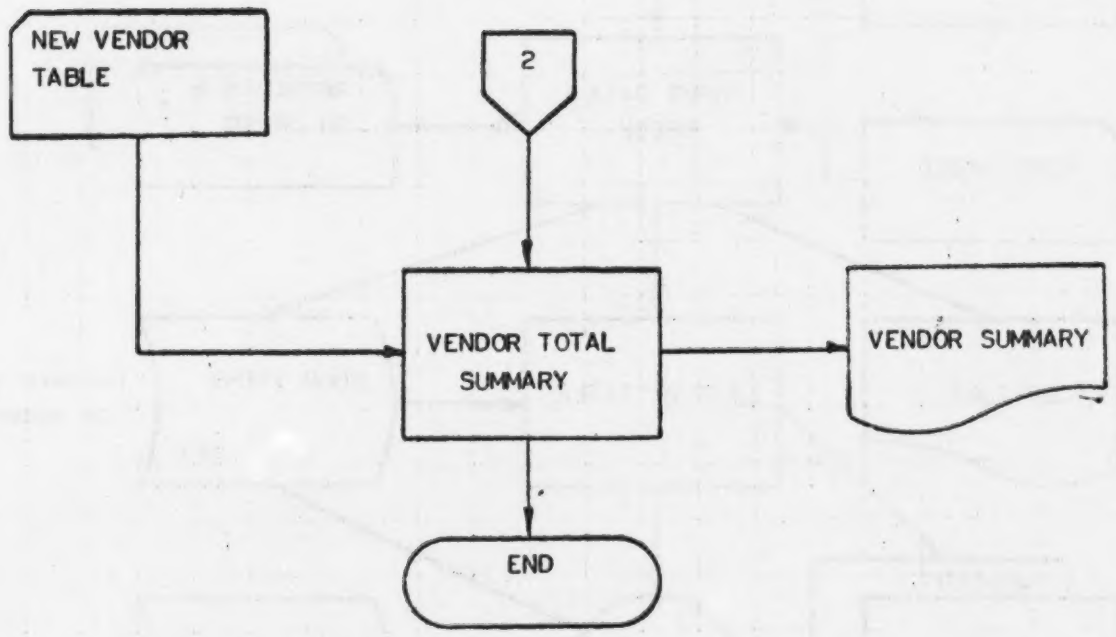
Company L A I

Application ACQUISITIONS SYSTEM by _____ Date JUNE 1970 Job No. _____ Sheet No. _____

FUND

FUND NO.	FUND TITLE	ALLOCATION $	CASH BAL. $	UN-ENCUM. BAL. $	# ITEMS DELIV.	# ITEMS ON ORDR	TABLE CREATE DATE		'F'
9 9 9 9	9 9 9 9


START
VENDOR TABLE
INPUT DATA CHECK
PAYMENTS & ON ORDER
FUND TABLE
EXCEPTIONS
LIST BY TITLE
GOOD ITEMS
DF1
(PAYMENTS & ON ORDER ITEMS)
PAYMENTS ON ORDER
SORT 1
SORTED GOOD ITEMS
DF2
ACCOUNT LIST
FUND LIST BY TITLE
NEW FUND TABLE (NEW TOTALS)
FUND TOTAL SUMMARY
FUND SUMMARY
GOOD ITEMS
DF3
SORT 2
VENDOR INVOICE SUMMARY
INVOICES
NEW VENDOR TABLE (NEW TOTALS)
2



DISK FILE DESCRIPTION

DF1 FILE OF VALID (ERROR FREE) PAYMENT AND ON-ORDER CARDS.

DF2 SAME AS DF1 EXCEPT IN SEQUENCE BY FUND #, TITLE.

DF3 SAME AS DF1 EXCEPT IN SEQUENCE BY VENDOR #, INVOICE #, TITLE.

SERIALS GROUP PROCEEDINGS

By

SAM A. DYSON

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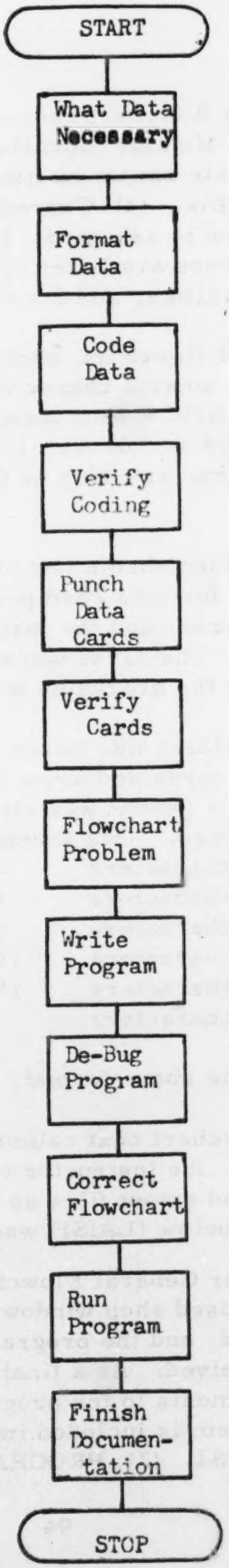
SERIALS GROUP PROCEEDINGS

By Sam A. Dyson

The Serials Group was composed of five participants who had indicated an interest in serials automation. In the first meeting the group was led by the instructor to list all the steps necessary to solve a serials problem. This list was then used to provide the group with a flowchart which they could use to solve serials automation problems. This first flowchart is listed as GENERAL FLOWCHART below.



GENERAL FLOWCHART

Then, using the flowchart constructed, the parameters were set for the first problem: (1) Monthly journals only would be included. (2) We assumed that the journals arrive on time or at the expected time. (3) We will work from a card file. (4) Current titles only were considered. (5) Dewey classification is assumed. (6) Data is contained on one 80 column card. (7) Three locations are listed by department and coded as follows: G = General, H = Humanities, and S = Science.

Referring to our flowchart, next the group described the data cards: (1) Title field - 70 alphameric characters. (2) Volume field - 4 numeric characters. (3) Year field - 4 numeric characters. (4) Format field - 1 numeric character coded as follows: 1 = print, 2 = microform. (5) Location field - 1 alphabetic character coded as follows: G = General, H = Humanities, and S = Science.

The instructor furnished a list of serials and the members of the group prepared coding sheets for data card production. Each member of the group keypunched five data cards, and the instructor punched an additional 43 for use in later programs. The cards were verified and batched in alphabetical order for processing in the programs we were to write.

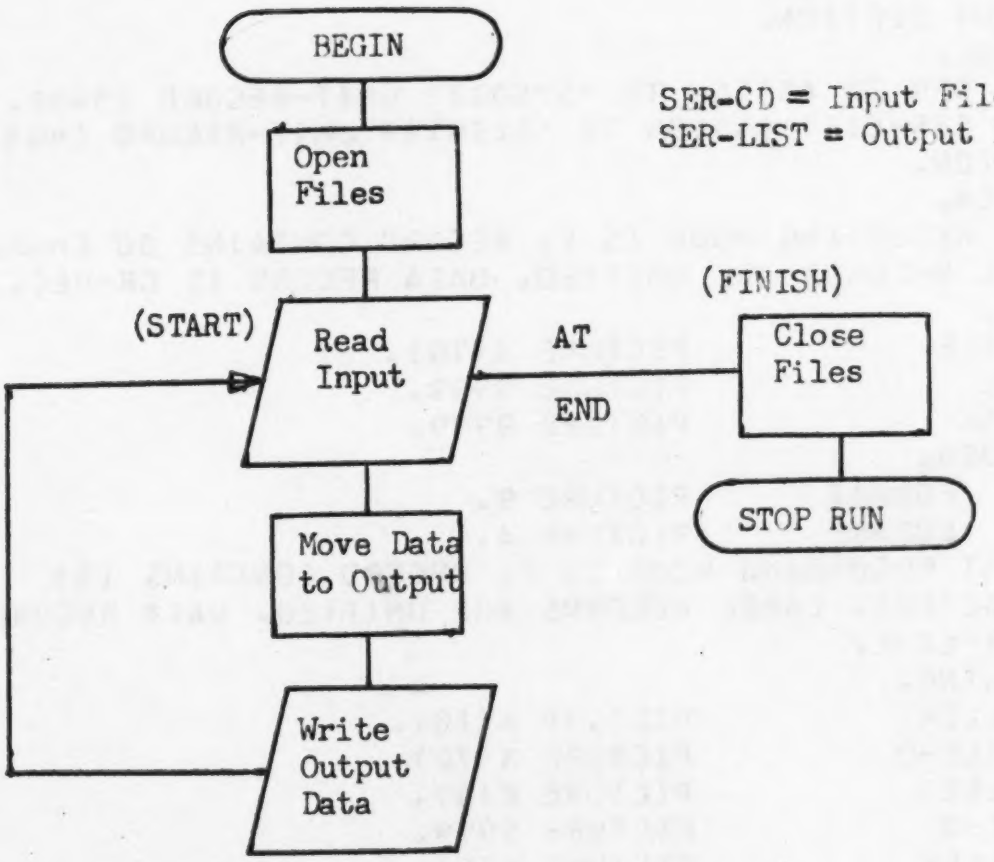
The specific problem was listed step-by-step. Our first group problem was to simply read the cards and write them on the printer in a to be determined format. The data card's format was already known. The group decided next to format the output record. This format was as follows:

(1) Filler - 10 characters
(2) Title - 70 characters
(3) Filler - 5 characters
(4) Volume - 4 characters
(5) Filler - 5 characters
(6) Year - 4 characters
(7) Filler - 7 characters
(8) Format - 1 character
(9) Filler - 5 characters
(10) Location - 1 character
(11) Filler - 12 characters

In order to determine the above format, the group used Printer Format sheets.

Our general flowchart next called for the group to flowchart the problem. During the flowcharting, the instructor encouraged the group members to jot down names for input and output files as well as any necessary paragraph names. The problem flowchart below (LAIS1) was prepared.

Still following our General Flowchart, they submitted their program cards and data to the closed shop window for running on the IBM 360. Errors received were corrected, and the programs re-submitted until the finished printout was finally received. As a final step, the documentation was corrected to include all the refinements to the program as it was finally accepted. Documentation for this problem is included immediately below and is as follows: (1) FLOWCHART - LAIS1, (2) PROGRAM - LAIS1, and (3) PRINTOUT - LAIS1.



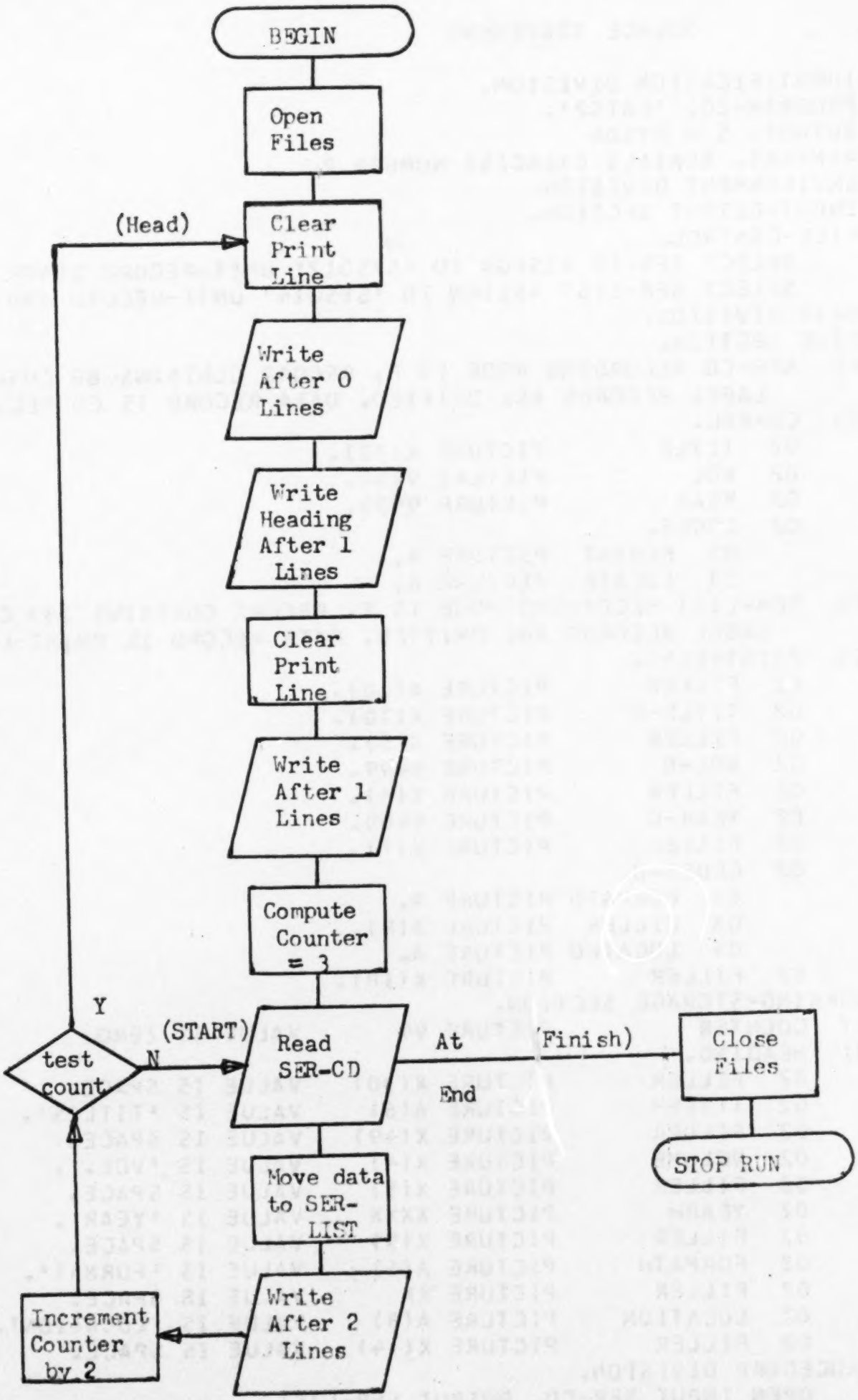
FLOWCHART - LAIS1

```
IDENTIFICATION DIVISION.
PROGRAM-ID. 'LAIS1'.
AUTHOR. WILLIAM W. WICKER.
REMARKS. SERIALS EXERCISE.
ENVIRONMENT DIVISION.
INPUT-OUTPUT SECTION.
FILE-CONTROL.
    SELECT SER-CD ASSIGN TO 'SYS012' UNIT-RECORD 2540R.
    SELECT SER-LIST ASSIGN TO 'SYS014' UNIT-RECORD 1403.
DATA DIVISION.
FILE SECTION.
FD  SER-CD RECORDING MODE IS F, RECORD CONTAINS 80 CHARACTERS,
      LABEL RECORDS ARE OMITTED, DATA RECORD IS CR-REC..
01  CD-REC.
    02  TITLE              PICTURE X(70).
    02  VOL                PICTURE 9999.
    02  YEAR               PICTURE 9999.
    02  CODES.
        03  FORMAT         PICTURE 9.
        03  LOCATE         PICTURE A.
FD  SER-LIST RECORDING MODE IS F, RECORD CONTAINS 133
      CHARACTERS, LABEL RECORDS ARE OMITTED, DATA RECORD IS
      PRINT-LINE.
01  PRINT-LINE.
    02  FILLER             PICTURE X(10).
    02  TITLE-O            PICTURE X(70).
    02  FILLER             PICTURE X(5).
    02  VOL-O              PICTURE 9999.
    02  FILLER             PICTURE X(5).
    02  YEAR-O             PICTURE 9999.
    02  FILLER             PICTURE X(5).
    02  CODES.
        03  FORMAT-O       PICTURE 9.
        03  FILLER         PICTURE XX.
        03  LOCATE-O       PICTURE A.
    02  FILLER             PICTURE X(26).
PROCEDURE DIVISION.
    OPEN INPUT SER-CD, OUTPUT SER-LIST.
    MOVE SPACES TO PRINT-LINE.
    WRITE PRINT-LINE AFTER ADVANCING 0 LINES.
START.
    MOVE SPACES TO PRINT-LINE.
    READ SER-CD AT END GO TO FINISH.
    MOVE TITLE TO TITLE-O.
    MOVE VOL TO VOL-O.
    MOVE YEAR TO YEAR-O.
    MOVE FORMAT TO FORMAT-O.
    MOVE LOCATE TO LOCATE-O.
    WRITE PRINT-LINE AFTER ADVANCING 2 LINES.
    GO TO START.
FINISH. CLOSE SER-CD, SER-LIST.
    STOP RUN.
```

ACADEMY OF POLITICAL SCIENCE, PROCEEDINGS	0026	1957	1	G
ACADEMY OF SCIENCES USSR, PROCEEDINGS, EARTH SCIENCES SECTIONS	0124	1959	1	S
BACTERIOLOGICAL REVIEWS	0001	1937	1	S
BANKING	0035	1942	1	G
BEST'S INSURANCE NEWS, FIRE AND CASUALITY EDITION	0058	1957	1	G
CANADIAN JOURNAL OF BOTANY	0042	1964	1	S
CANADIAN JOURNAL OF CHEMICAL ENGINEERING	0035	1957	1	S
CANADIAN JOURNAL OF CHEMISTRY	0028	1950	1	S
CAMELLIA JOURNAL	0016	1961	1	S
DESIGN (COLUMBUS, OHIO)	0028	1926	1	H
DESIGN (LONDON)	0049	1953	1	H
E L H (ENGLISH LITERARY HISTORY)	0032	1965	1	H
EAST EUROPE	0007	1958	1	H
ECOLOGICAL MONOGRAPHS	0001	1931	1	S
ECONOMIC GEOGRAPHY	0005	1929	1	H
FARADAY SOCIETY, TRANSACTIONS	0050	1954	1	S
FARM QUARTERLY	0023	1968	1	S
FEDERAL REPORTER	0100	1939	1	G
FEED AND FARM SUPPLIER	0036	1962	1	G
GAS	0012	1936	1	S
GAS AGE	0097	1946	1	S
GENERAL ELECTRIC REVIEW	0018	1915	1	S
GENERAL MOTORS ENGINEERING JOURNAL	0001	1953	1	S
GENETIC PSYCHOLOGY MONOGRAPHS	0075	1967	1	H

The next problem is a further development of the first one. It added headings and line counters to our first problem. Some of the steps taken in the first problem did not have to be repeated in this problem, but adjustments had to be made in the program to provide for the counter and headings.

The flowchart resulting is listed below as FLOWCHART - LAIS2. Two new options were introduced here, namely the COMPUTE and IF statement. Again, all the steps in our General Flowchart were completed and the following documentation resulted: (1) FLOWCHART - LAIS2, (2) PROGRAM - LAIS2, and (3) PRINTOUT - LAIS2.



FLOWCHART - LAIS2

```
       IDENTIFICATION DIVISION.
       PROGRAM-ID. 'LAIS2'.
       AUTHOR. S A DYSON
       REMARKS. SERIALS EXERCISE NUMBER 2.
       ENVIRONMENT DIVISION.
       INPUT-OUTPUT SECTION.
       FILE-CONTROL.
           SELECT SER-CD ASSIGN TO 'SYS012' UNIT-RECORD 2540R.
           SELECT SER-LIST ASSIGN TO 'SYS014' UNIT-RECORD 1403.
       DATA DIVISION.
       FILE SECTION.
       FD  SER-CD RECORDING MODE IS F, RECORD CONTAINS 80 CHARACTERS,
             LABEL RECORDS ARE OMITTED, DATA RECORD IS CD-REC.
       01  CD-REC.
           02  TITLE        PICTURE X(70).
           02  VOL          PICTURE 9999.
           02  YEAR         PICTURE 9999.
           02  CODES.
               03  FORMAT   PICTURE 9.
               03  LOCATE   PICTURE A.
       FD  SER-LIST RECORDING MODE IS F, RECORD CONTAINS 133 CHARACTERS,
             LABEL RECORDS ARE OMITTED, DATA RECORD IS PRINT-LINE.
       01  PRINT-LINE.
           02  FILLER       PICTURE X(10).
           02  TITLE-O      PICTURE X(70).
           02  FILLER       PICTURE X(5).
           02  VOL-O        PICTURE 9999.
           02  FILLER       PICTURE X(5).
           02  YEAR-O       PICTURE 9999.
           02  FILLER       PICTURE X(7).
           02  CODES-O.
               03  FORMATO  PICTURE 9.
               03  FILLER   PICTURE X(8).
               03  LOCATEO  PICTURE A.
           02  FILLER       PICTURE X(18).
       WORKING-STORAGE SECTION.
       77  COUNTER          PICTURE 99      VALUE IS ZERO.
       01  HEADING.
           02  FILLER       PICTURE X(30)   VALUE IS SPACE.
           02  TITLEH       PICTURE A(6)    VALUE IS 'TITLES'.
           02  FILLER       PICTURE X(49)   VALUE IS SPACE.
           02  VOLUME       PICTURE X(4)    VALUE IS 'VOL.'.
           02  FILLER       PICTURE X(5)    VALUE IS SPACE.
           02  YEARH        PICTURE XXXX    VALUE IS 'YEAR'.
           02  FILLER       PICTURE X(5)    VALUE IS SPACE.
           02  FORMATH      PICTURE A(6)    VALUE IS 'FORMAT'.
           02  FILLER       PICTURE XX      VALUE IS SPACE.
           02  LOCATION     PICTURE A(8)    VALUE IS 'LOCATION'.
           02  FILLER       PICTURE X(14)   VALUE IS SPACE.
       PROCEDURE DIVISION.
           OPEN INPUT SER-CD, OUTPUT SER-LIST.
       HEAD. MOVE SPACES TO PRINT-LINE.
           WRITE PRINT-LINE AFTER 0 LINES.
           WRITE PRINT-LINE FROM HEADING AFTER 1 LINES.
           MOVE SPACES TO PRINT-LINE.
           WRITE PRINT-LINE AFTER 1 LINES.
```

```
SEQ. NO.          SOURCE STATEMENT

          COMPUTE COUNTER = 3.
       START. READ SER-CD AT END GO TO FINISH.
          MOVE SPACES TO PRINT-LINE.
          MOVE TITLE TO TITLE-O.
          MOVE VOL  TO VOL-O.
          MOVE YEAR TO YEAR-O.
          MOVE FORMAT TO FORMATO.
          MOVE LOCATE TO LOCATEO.
          WRITE PRINT-LINE AFTER 2 LINES.
          COMPUTE COUNTER = COUNTER + 2.
          IF COUNTER EQUAL TO 53 OR COUNTER GREATER THAN 53 GO TO HEAD,
            OTHERWISE GO TO START.
       FINISH. CLOSE SER-CD, SER-LIST.
          STOP RUN.
```

TITLES

ACADEMY OF POLITICAL SCIENCE, PROCEEDINGS

ACADEMY OF SCIENCES USSR, PROCEEDINGS, EARTH SCIENCES SECTIONS

BACTERIOLOGICAL REVIEWS

BANKING

BEST'S INSURANCE NEWS, FIRE AND CASUALITY EDITION

CANADIAN JOURNAL OF BOTANY

CANADIAN JOURNAL OF CHEMICAL ENGINEERING

CANADIAN JOURNAL OF CHEMISTRY

CAMELLIA JOURNAL

DESIGN (COLUMBUS, OHIO)

DESIGN (LONDON)

E L H (ENGLISH LITERARY HISTORY)

EAST EUROPE

ECOLOGICAL MONOGRAPHS

ECONOMIC GEOGRAPHY

FARADAY SOCIETY,TRANSACTIONS

FARM QUARTERLY

FEDERAL REPORTER

FEED AND FARM SUPPLIER

GAS

GAS AGE

GENERAL ELECTRIC REVIEW

GENERAL MOTORS ENGINEERING JOURNAL

GENETIC PSYCHOLOGY MONOGRAPHS

HARPER'S BAZAAR

VOL.	YEAR	FORMAT	LOCATION
0026	1957	1	G
0124	1959	1	S
0001	1937	1	S
0035	1942	1	G
0058	1957	1	G
0042	1964	1	S
0035	1957	1	S
0028	1950	1	S
0016	1961	1	S
0028	1926	1	H
0049	1953	1	H
0032	1965	1	H
0007	1958	1	H
0001	1931	1	S
0005	1929	1	H
0050	1954	1	S
0023	1968	1	S
0100	1939	1	G
0036	1962	1	G
0012	1936	1	S
0097	1946	1	S
0018	1915	1	S
0001	1953	1	S
0075	1967	1	H
0122	1958	1	H

TITLES

HARPER'S MAGAZINE

HARPER'S WEEKLY

HARVARD BUSINESS REVIEW

HARVARD EDUCATIONAL REVIEW

HARVARD LAW REVIEW

INTERNATIONAL COMMERCE

INTERNATIONAL CHEMICAL ENGINEERING

INTERNATIONAL ECONOMIC REVIEW

INTERNATIONAL GEOLOGY REVIEW

INTERNATIONAL JOURNAL FOR THE EDUCATION OF THE BLIMD

INTERNATIONAL JOURNAL OF ENGINEERING SCIENCE

INTERNATIONAL JOURNAL OF MECHANICAL SCIENCES

JOURNAL FUR DIE REINE UND ANGEWANDTE MATHEMATIK

JOURNAL FUR PRAKTISCHE CHEMIE

JOURNAL OF ABNORMAL AND SOCIAL PSYCHOLOGY

JOURNAL OF ENGLISH AND GERMANIC PHILOLOGY

KANSAS UNIVERSITY, SCIENCE BULLETIN

KENYON REVIEW

LADIES' HOME JOURNAL

LABOR LAW JOURNAL

LANCET

LAND ECONOMICS

LANDSCAPE ARCHITECTURE

LAW AND CONTEMPORARY PROBLEMS

MC CALL'S

VOL.	YEAR	FORMAT	LOCATION
0067	1850	1	G
0004	1860	1	G
0001	1922	1	H
0035	1965	1	H
0067	1953	1	H
Z			
0002	1962	1	S
0008	1967	1	H
0001	1959	1	S
0010	1960	1	H
0005	1967	1	S
0001	1960	1	S
0221	1966	1	S
0002	1955	1	S
0048	1953	1	H
0066	1367	1	G
0026	1939	1	S
0001	1939	1	G
0062	1945	1	G
0010	1959	1	H
0001	1940	1	S
0026	1950	1	H
0030	1959	2	G
0020	1955	1	H
0087	1959	1	G

TITLES

MACHINE DESIGN

MACHINERY

MAGAZINE OF ART

MAGAZINE OF WALL STREET

MANAGEMENT ACCOUNTING, SECTION 1

NATION

NATIONAL ACADEMY OF SCIENCES, PROCEEDINGS

NATIONAL ASSOCIATION OF SECONDARY SCHOOL PRINCIPLES, BULLETIN

NATIONAL ASSOCIATION OF TEACHERS OF SINGING, BULLETIN

OFFICE EXECUTIVE

OFFICE APPLIANCES

OFFICE MANAGEMENT

OFFICE MANAGEMENT AND AMERICAN BUSINESS

PACIFIC AFFAIRS

PACIFIC HISTORICAL REVIEW

QUARTERLY JOURNAL OF ECONOMICS

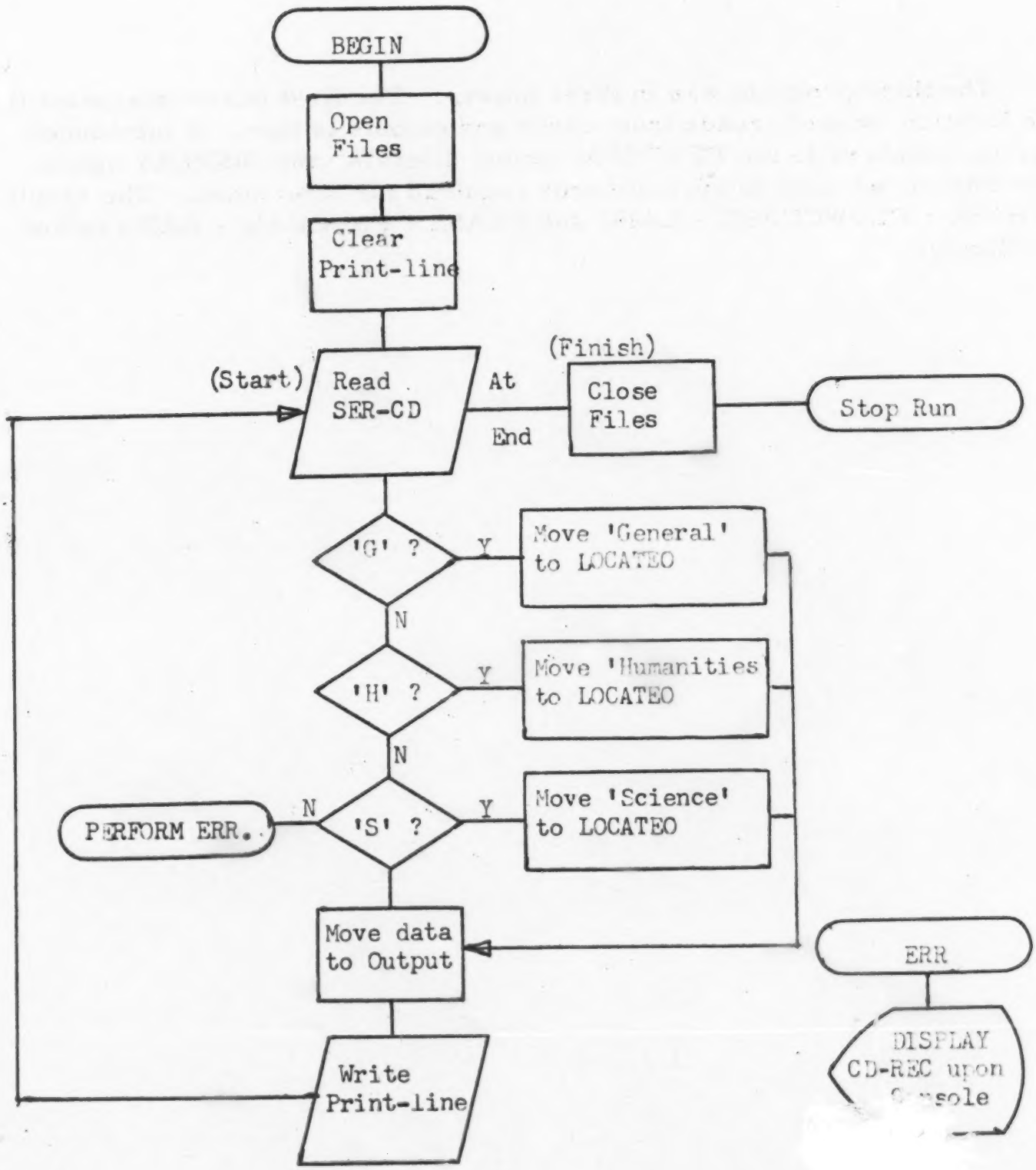
QUARTERLY JOURNAL OF MATHEMATICS

QUARTERLY JOURNAL OF MICROSCOPICAL SCIENCE

PRINTOUT - [illegible] continued

VOL.	YEAR	FORMAT	LOCATION
0021	1949	1	S
0055	1949	1	S
0030	1937	1	H
0092	1953	1	H
0047	1965	1	H
0014	1872	2	G
0032	1946	2	7
0026	1942	2	H
0014	1958	2	H
0028	1953	2	H
0127	1968	2	H
0021	1960	2	H
0021	1960	2	H
0001	1928	2	H
0027	1958	2	H
0067	1963	2	H
0011	1960	1	S
0101	1960	1	S

The third program was in three phases. The first phase interprets the coded location symbol, reads from cards and outputs to tape. It introduced the group members to the PERFORM option, literals, and DISPLAY option. It also introduced them to system cards required for tape output. The resulting PHASE 1 FLOWCHART - LAIS3 and PHASE 1 PROGRAM - LAIS3 follow immediately.



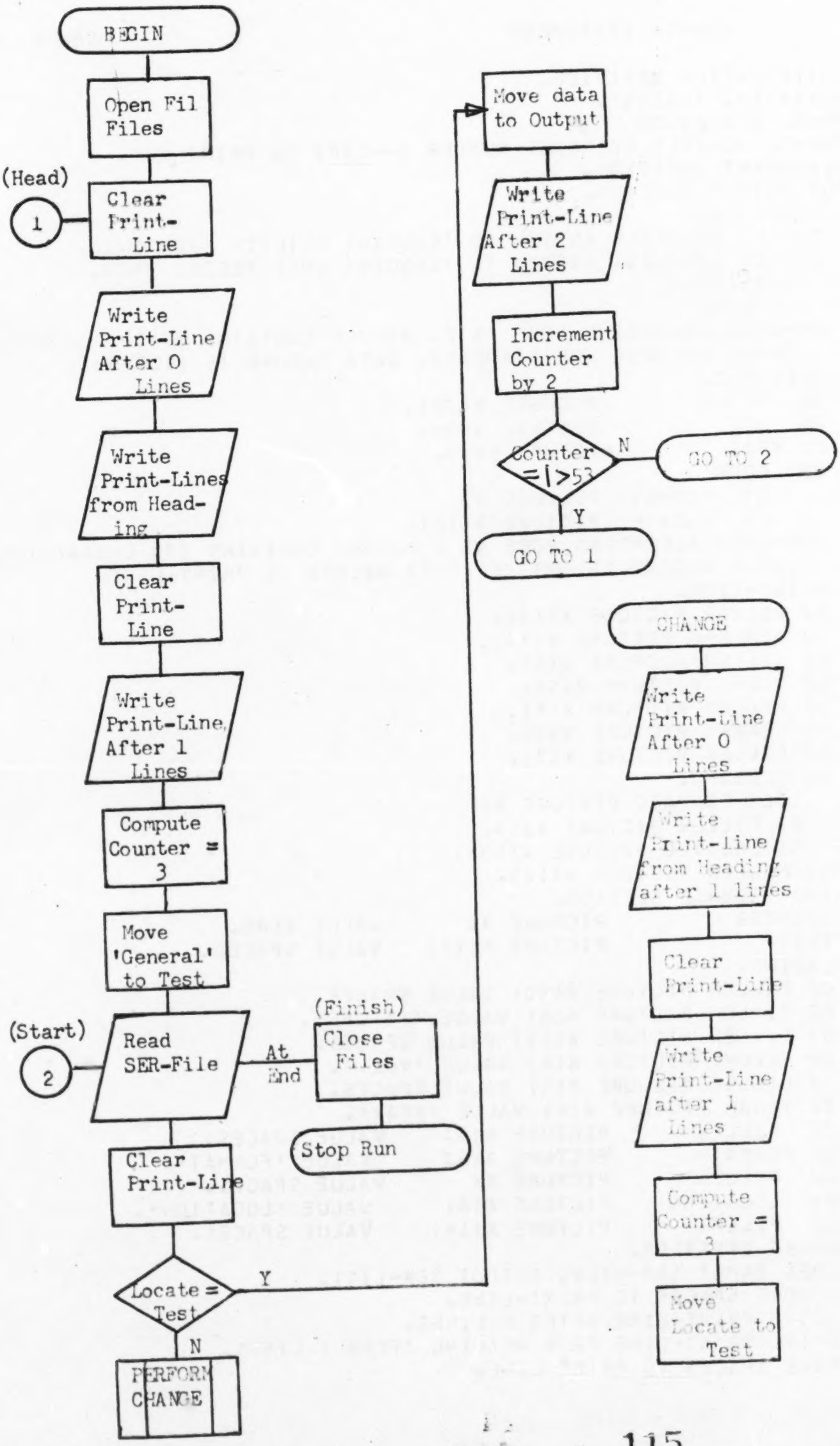
PHASE 1 FLOWCHART - LAIS3

SOURCE STATEMENT CBD CL3-5 06/25/70

```
IDENTIFICATION DIVISION.
PROGRAM-ID. 'LAIS3'.
AUTHOR. S A DYSON
REMARKS. SERIALS EXERCISE NUMBER THREE--CARDS,TAPE,DSORT,PRINT
ENVIRONMENT DIVISION.
INPUT-OUTPUT SECTION.
FILE-CONTROL.
    SELECT SER-CD ASSIGN TO 'SYS012' UNIT-RECORD 2540R,
    SELECT SER-LIST ASSIGN TO 'SYS016' UTILITY 2400 UNIT.
DATA DIVISION.
FILE SECTION.
FD  SER-CD RECORDING MODE IS F, RECORD CONTAINS 80 CHARACTERS,
      LABEL RECORDS ARE OMITTED, DATA RECORD IS CD-REC.
01  CD-REC.
    02 TITLE          PICTURE X(70).
    02 VOL            PICTURE 9999.
    02  YEAR          PICTURE 9999.
    02  CODES.
        03 FORMAT     PICTURE 9.
        03  LOCATE    PICTURE A.
FD  SER-LIST RECORDING MODE IS F, RECORD CONTAINS 89 CHARACTERS,
      LABEL RECORDS ARE STANDARD, DATA RECORD IS PRINT-LINE.
01   PRINT-LINE.
    02  TITLE-O       PICTURE X(70).
    02  VOL-O         PICTURE 9999.
    02  YEAR-O        PICTURE 9999.
    02  CODES-O.
        03  FORMATO PICTURE 9.
        03  LOCATEO PICTURE A(10).
PROCEDURE DIVISION.
    OPEN INPUT SER-CD, OUTPUT SER-LIST.
    MOVE SPACES TO PRINT-LINE.
START. READ SER-CD AT END GO TO FINISH.
    IF LOCATE = 'G' PERFORM PROC-A, ELSE IF LOCATE = 'H' PERFORM
        PROC-B, ELSE IF LOCATE = 'S' PERFORM PROC-C OTHERWISE
        PERFORM ERR.
    MOVE TITLE TO TITLE-O.
    MOVE VOL TO VOL-O.
    MOVE YEAR TO YEAR-O.
    MOVE FORMAT TO FORMATO.
    WRITE PRINT-LINE.
    GO TO START.
PROC-A. MOVE 'GENERAL' TO LOCATEO.
PROC-B. MOVE 'HUMANITIES' TO LOCATEO.
PROC-C. MOVE 'SCIENCE' TO LOCATEO.
ERR. DISPLAY CD-REC UPON CONSOLE.
FINISH. CLOSE SER-CD, SER-LIST.
    STOP RUN.
```

The second phase of the program was one the instructor secured from the library of the Tech Computing Center which sorts information - it reads from a tape on to a disc, sorts by predetermined key, and outputs on to the same tape. The main thing that the group members learned here was the system cards necessary for random and sequential access files from tape and disc. This phase is omitted because it was n t the work of the group, but a "canned" program secured to do a specific job. The instructor felt, and correctly so it turned out, that the group would not have time to grasp the full meaning of the sort program and still have time to do phase three of this problem. The input tape for phase two was the output tape prepared in phase one of this problem.

The third phase of this problem reads from the sorted tape output in phase two and prints it out on the printer. This phase introduced no new concepts but instead called for the use of nearly everything we had learned to this point. Adjustments had to be made in the output format, a test area had to be set up, and a deeper logic used to successfully complete this program. The group did not complete this phase before the end of the institute. One participant did get his phase three written and run once on the computer, but it was not successful. Therefore, the phase three documentation included immediately below is the instructor's suggested solution to the problem. Included is PHASE 3 FLOWCHART - LAIS3, PHASE 3 PROGRAM - LAIS3, and PHASE 3 PRINTOUT - LAIS3.



PHASE 3 FLOWCHART - LAIS3

```
IDENTIFICATION DIVISION.
PROGRAM-ID. 'LAIS3'.
AUTHOR. S A DYSON
REMARKS. SERIALS EXERCISE NUMBER 3--TAPE TO PRINT OUT.
ENVIRONMENT DIVISION.
INPUT-OUTPUT SECTION.
FILE-CONTROL.
    SELECT SER-FILE ASSIGN TO 'SYS016' UTILITY 2400 UNIT.
    SELECT SER-LIST ASSIGN TO 'SYS014' UNIT-RECORD 1403.
DATA DIVISION.
FILE SECTION.
FD SER-FILE RECORDING MODE IS F, RECORD CONTAINS 89 CHARACTERS,
     LABEL RECORDS ARE STANDARD, DATA RECORD IS FILE-REC.
01  FILE-REC.
    02  TITLE        PICTURE X(70).
    02  VOL          PICTURE 9999.
    02 YEAR         PICTURE 9999.
    02  CODE.
        03  FORMAT   PICTURE 9.
        03  LOCATE   PICTURE A(10).
FD  SER-LIST RECORDING MODE IS F RECORD CONTAINS 133 CHARACTERS
     LABEL RECORD IS OMITTED DATA RECORD IS PRINT-LINE.
01  PRINT-LINE.
    02 FILLER PICTURE X(10).
    02 TITLE-O PICTURE X(70).
    02 FILLER PICTURE X(5).
    02 VOL-O PICTURE 9999.
    02 FILLER PICTURE X(5).
    02 YEAR-O PICTURE 9999.
    02 FILLER PICTURE X(7).
    02 CODES-O.
       03 FORMATO PICTURE 9.
      03 FILLER PICTURE X(5).
      03 LOCATEO PICTURE A(10).
    02 FILLER PICTURE X(12).
WORKING-STORAGE SECTION.
77  COUNTER          PICTURE 99      VALUE ZERO.
77  TEST             PICTURE X(10)   VALUE SPACES.
01 HEADING.
    02 FILLER PICTURE X(30) VALUE SPACES.
    02 TITLEH PICTURE A(6) VALUE 'TITLES'.
    02 FILLER PICTURE X(49) VALUE SPACES.
    02 VOLUME PICTURE X(4) VALUE 'VOL.'.
    02 FILLER PICTURE X(5) VALUE SPACES.
    02 YEARH PICTURE A(4) VALUE 'YEAR'.
    02  FILLER       PICTURE X(5)    VALUE SPACES.
    02 FORMATH       PICTURE A(6)     VALUE 'FORMAT'.
    02  FILLER       PICTURE XX      VALUE SPACES.
    02  LOCATION     PICTURE A(8)     VALUE 'LOCATION'.
    02  FILLER       PICTURE X(14)    VALUE SPACES.
PROCEDURE DIVISION.
    OPEN INPUT SER-FILE, OUTPUT SER-LIST.
HEAD. MOVE SPACES TO PRINT-LINE.
    WRITE PRINT-LINE AFTER 0 LINES.
    WRITE PRINT-LINE FROM HEADING AFTER 1 LINES.
    MOVE SPACES TO PRINT-LINE.
```

```
D.          SOURCE STATEMENT

      WRITE PRINT-LINE AFTER 1 LINES.
      COMPUTE COUNTER = 3.
      MOVE 'GENERAL    ' TO TEST.
  START. READ SER-FILE AT END GO TO FINISH.
      MOVE SPACES TO PRINT-LINE.
      IF LOCATE NOT EQUAL TO TEST PERFORM CHANGE.
      MOVE TITLE TO TITLE-O.
      MOVE VOL TO VOL-O.
      MOVE YEAR TO YEAR-O.
      MOVE FORMAT TO FORMATO.
      MOVE LOCATE TO LOCATEO.
      WRITE PRINT-LINE AFTER 2 LINES.
      COMPUTE COUNTER = COUNTER + 2.
      IF COUNTER EQUAL TO 53 OR COUNTER GREATER THAN 53 GO TO HEAD,
      OTHERWISE GO TO START.
  CHANGE. WRITE PRINT-LINE AFTER 0 LINES.
      WRITE PRINT-LINE FROM HEADING AFTER 1 LINES.
      WRITE PRINT-LINE AFTER 1 LINES.
      COMPUTE COUNTER = 3.
      MOVE LOCATE TO TEST.
  FINISH. CLOSE SER-FILE, SER-LIST.
      STOP RUN.
```

TITLES

ACADEMY OF POLITICAL SCIENCE, PROCEEDINGS

BANKING

BEST'S INSURANCE NEWS, FIRE AND CASUALITY EDITION

FEDERAL REPORTER

FEED AND FARM SUPPLIER

HARPER'S MAGAZINE

HARPER'S WEEKLY

JOURNAL OF ENGLISH AND GERMANIC PHILOLOGY

KENYON REVIEW

LADIES' HOME JOURNAL

MC CALL'S

VOL.	YEAR	FORMAT	LOCATION
0026	1957	1	GENERAL
0035	1942	1	GENERAL
0058	1957	1	GENERAL
0100	1939	1	GENERAL
0036	1962	1	GENERAL
0067	1850	1	GENERAL
0004	1860	1	GENERAL
0066	1367	1	GENERAL
0001	1939	1	GENERAL
0062	1945	1	GENERAL
0087	1959	1	GENERAL

TITLES

DESIGN (COLUMBUS, OHIO)

DESIGN (LONDON)

E L H (ENGLISH LITERARY HISTORY)

EAST EUROPE

ECONOMIC GEOGRAPHY

GENETIC PSYCHOLOGY MONOGRAPHS

HARPER'S BAZAAR

HARVARD BUSINESS REVIEW

HARVARD EDUCATIONAL REVIEW

HARVARD LAW REVIEW

INTERNATIONAL ECONOMIC REVIEW

INTERNATIONAL JOURNAL FOR THE EDUCATION OF THE BLIND

JOURNAL OF ABNORMAL AND SOCIAL PSYCHOLOGY

LABOR LAW JOURNAL

LAND ECONOMICS

LAW AND CONTEMPORARY PROBLEMS

MAGAZINE OF ART

MAGAZINE OF WALL STREET

MANAGEMENT ACCOUNTING, SECTION 1

VOL.	YEAR	FORMAT	LOCATION
0028	1926	FORMAT	HUMANITIES
0049	1953	1	HUMANITIES
0032	1965	1	HUMANITIES
0007	1958	1	HUMANITIES
0005	1929	1	HUMANITIES
0075	1967	1	HUMANITIES
0122	1958	1	HUMANITIES
0001	1922	1	HUMANITIES
0035	1965	1	HUMANITIES
0067	1953	1	HUMANITIES
0008	1967	1	HUMANITIES
0010	1960	1	HUMANITIES
0048	1953	1	HUMANITIES
0010	1959	1	HUMANITIES
0026	1950	1	HUMANITIES
0020	1955	1	HUMANITIES
0030	1937	1	HUMANITIES
0092	1953	1	HUMANITIES
0047	1965	1	HUMANITIES

TITLES

ACADEMY OF SCIENCES USSR, PROCEEDINGS, EARTH SCIENCES SECTIONS

BACTERIOLOGICAL REVIEWS

CANADIAN JOURNAL OF BOTANY

CANADIAN JOURNAL OF CHEMICAL ENGINEERING

CANADIAN JOURNAL OF CHEMISTRY

CAMELLIA JOURNAL

ECOLOGICAL MONOGRAPHS

FARADAY SOCIETY,TRANSACTIONS

FARM QUARTERLY

GAS

GAS AGE

GENERAL ELECTRIC REVIEW

GENERAL MOTORS ENGINEERING JOURNAL

INTERNATIONAL CHEMICAL ENGINEERING

INTERNATIONAL GEOLOGY REVIEW

INTERNATIONAL JOURNAL OF ENGINEERING SCIENCE

INTERNATIONAL JOURNAL OF MECHANICAL SCIENCES

JOURNAL FUR DIE REINE UND ANGEWANDTE MATHEMATIK

JOURNAL FUR PRAKTISCHE CHEMIE

KANSAS UNIVERSITY, SCIENCE BULLETIN

LANCET

MACHINE DESIGN

MACHINERY

QUARTERLY JOURNAL OF MATHEMATICS

QUARTERLY JOURNAL OF MICROSCOPICAL SCIENCE

VOL.	YEAR	FORMAT	LOCATION
0124	1959	FO1MAT	SCIENCE
0001	1937	1	SCIENCE
0042	1964	I	SCIENCE
0035	1957	1	SCIENCE
0028	1950	1	SCIENCE
0016	1961	1	SCIENCE
0001	1931	1	SCIENCE
0050	1954	1	SCIENCE
0023	1968	1	SCIENCE
0012	1936	1	SCIENCE
0097	1946	1	SCIENCE
0018	1915	1	SCIENCE
0001	1953	1	SCIENCE
0002	1962	1	SCIENCE
0001	1959	1	SCIENCE
0005	1967	1	SCIENCE
0001	1960	1	SCIENCE
0221	1966	1	SCIENCE
C002	1955	1	SCIENCE
0026	1939	1	SCIENCE
0001	1940	1	SCIENCE
0021	1949	1	SCIENCE
0055	1949	1	SCIENCE
0011	1960	1	SCIENCE
0101	1960	1	SCIENCE

TITLES

LANDSCAPE ARCHITECTURE

NATION

VOL.	YEAR	FORMAT	LOCATION
0030	1959	2	GENERAL
0014	1872	2	GENERAL

TITLES

NATIONAL ASSOCIATION OF SECONDARY SCHOOL PRINCIPLES, BULLETIN

NATIONAL ASSOCIATION OF TEACHERS OF SINGING, BULLETIN

OFFICE EXECUTIVE

OFFICE APPLIANCES

OFFICE MANAGEMENT

OFFICE MANAGEMENT AND AMERICAN BUSINESS

PACIFIC AFFAIRS

PACIFIC HISTORICAL REVIEW

QUARTERLY JOURNAL OF ECONOMICS

VOL.	YEAR	FORMAT	LOCATION
0026	1942	FO2MAT	HUMANITIES
0014	1958	2	HUMANITIES
0028	1953	2	HUMANITIES
0127	1968	2	HUMANITIES
0021	1960	2	HUMANITIES
0021	1960	2	HUMANITIES
0001	1928	2	HUMANITIES
0027	1958	2	HUMANITIES
0067	1963	2	HUMANITIES

The resulting method for solving this problem is not suggested as the best or most efficient way but only as an example of how one group of people who were learning library applications of computers did it. It is remarkable that the participants progressed as far as they did in the short while they had. They deserve a great deal of credit for their willingness to work and learn a tremendous amount of material in only two weeks.

AUTOMATING ACADEMIC LIBRARY BUDGETS

(Note: This presentation was not available for publication)

AUTOMATING ACQUISITIONS

By

BRUCE ALPER

131 SCI

AUTOMATING ACQUISITIONS

The library acquisitions information system was designed for a particular institution at a particular time. At the time it was brought to life, FAU had some very serious problems. Before I go into the system itself, for which you have documentation, I have some notes on acquisition systems in general.

The acquisition system for any library has two halves, the scholarly selection of materials to be acquired, and the "nuts and bolts" operation of acquiring those materials and putting them into the cataloging operation. This scholarly process that is called material selection is not to be discussed in this presentation.

Acquisition systems can be classified by their architecture. First, we can describe them by their data content. Some systems include only accounting information, while others include accounting information plus partial bibliographic data. In still other systems, data content is a pre-cataloging acquisition system. There are, of course, all shades of gray in between these three.

Second, under architecture, we can also talk about the hardware the system uses. You can have a system that uses no hardware at all--completely hand operated in every way. Then you can have a mechanically augmented system, where you use a posting machine to list your ledgers. A third step would be the use of an accounting machine. The fourth level is really the first entrance of the computer system, and this would be a computer batch processing operation; by batch processing, I mean discreet steps in the operation. The fifth, and by far the most expensive system of all, is the teleprocessing operation using a remote terminal hooked to a central computer facility somewhere on your campus or somebody else's campus. This system can be divided into two parts:
(1) where the computer is devoted totally to doing the library work, or
(2) time sharing, where others are using the computer simultaneously for other things.

What are the basic requirements for an acquisitions system? You have a searching process to determine if you already own the material, if it is in process, or on order. The searching process also completes the bibliographic information necessary to order the volume. The next major phase in an acquisition system would be the placement of an order. You would select a vendor, create a purchase order, and encumber funds for the item. The third operation within the acquisition system would be order follow-up. The fourth operation would be receiving.

Acquisition systems can also be classified by structure of responsibility.

1. The Library can be responsible for all operations.
2. It can request some central agency on campus to order materials.
3. The Library can order through a local co-operative venture. Again, there are various shades of gray between these. You may have a library which uses a cooperative center for part of its acquisitions, and has responsibility for ordering all other materials. FAU has selected a path between number 1 and 2.

FAU's first effort was a full bibliographic system. Use was made of an IBM 1460 computer in this batch processing system. Two persons, professionals, were devoted to nothing but entering and correcting data for the system. There were considerable errors in input. We had a lot of overhead in the system. It took two weeks for a purchase order to get out of the computer and in the mail. In addition, the products of the system were limited. There was no accessions list by title or author. The system was inadequate in every way. Partial shipments were a fantastic problem. Keypunching time for this system ran around ten minutes per title.

Keep in mind the size of FAU. By January, 1967, this system had totally failed. During the period from September, 1966 - September, 1967 there was no library. The books were there, but they were absolutely inaccessible. There was a backlog of some 70,000 volumes in the library that had been put on the shelves without cataloging for use. There was no way to tell what or where they were.

From January, 1967 to June, 1968 the University Business Office assumed all acquisition operations except for selection and searching. During this time the processing cycle took six weeks on the average. In addition to excessive time delays, the input data requirements of the business office system were not compatible with the bibliographic nature of the library input. As you can tell, this operation was something less than a success. Actually, total disaster was avoided only through the withdrawal of most of the book budget by the State Board of Regents. In September, 1967, Dr. Axford arrived on the campus and we began the design of a new acquisitions system.

The next thing we are going to talk about is the parameters for the systems design. At FAU our main parameter in all operations is public service. We are being paid to serve the public, and this is what our system is for.

1. First of all, we could not afford any additional library systems staff.
2. We would collect minimal bibliographic data.
3. We insisted on a library system. We were going to take the processing responsibility away from the business office. Their turnaround time was much too slow.

4. The system was to be designed to allow for future possible on-line data collection, eliminating the use of the keypunch.

5. Computer time must be kept to a minimum.

6. There must be a data interface with the business office system.

7. The data record for these will contain at least the following items: author, title, vendor identification, estimated price, date ordered, price paid, date received, vendor invoice number, quantity of material, fund accounting number, identification for serial items, ability to account for postage, and shipping charges completely separate of the material.

8. The computer system available was an IBM 360 model 40, with 32 K positions of memory, 4 tape drives, 1 disc drive kept available for data work files, (no permanent disc files were allowed on the system) and a card reader-punch and a printer.

9. The state required programming language was COBOL. So you can see some pretty stringent program designs criteria.

In addition, we had a psychology on the campus that we had to combat. There was no confidence in the library.

As you will note by the end of this presentation, all design parameters were met and exceeded. In fact, it has become the standard against which other systems are measured.

My basic philosophy is that when I install a system, I install the very basic minimum at the outset. We installed July 1, 1968, a system composed of nine programs. The system was absolutely the bare essentials and we have updated it from there. Now we can go into the handout * I gave you consisting of

1) the documentation packet,
2) the purchase order breakdown, and
3) the Richard Abel approval plan.

Consider this documentation in two ways. One, a document for our use here, and two, an outline of the absolute bare minimum that you need for any operating acquisitions system. I have to admit that the tendency is, when designing systems, to bypass documentation in favor of implementation. Systems people tend not to document. Documentation takes more time than actually writing the program or designing the system. Nine months ago we put a halt to all development of systems that had not been designed up to that date. We are using this time to document in detail everything that has been done up to this date.

The first eleven pages constitute a complete system flow chart of the acquisition system as it exists, including the interface for the acquisitions information system. I have not put in the serials operation into this flowchart intentionally; that is a whole system in itself. Since we are going to have a

* Note: This was included in the participant's packet of program materials and supplies.

presentation on serials, I will presume it can be interfaced. The first three pages of this flowchart constitutes the ordering procedure and they are noted as such. Ordering is the simplest part of this procedure. The rest of the eleven pages illustrate the receiving operation.

Let me explain how to read a flowchart. Solid lines indicate processing flow. Dotted lines indicate material or information flow. This is my standard for this particular flowchart.

The purchase order has six copies: purchase order copy, yellow LC card copy, fund copy (second), shipping, and vendor, and then a green on-order copy, which is the last one. The green copy card goes into the title catalog to indicate that the item is on order. The information contained on the form is relatively self-explanatory. On the back of the vendor copy there is a feedback notice for vendor use. After you go through this flowchart, you will see these individual copies of the order form used in different places.

Keep in mind that this flowchart is designed to use FAU's resources, and I am sure, given additional resources and personnel, things could be done differently. In this flow chart you will find unique symbols used. Those symbols are defined on page 13. Page 12 has a definition of each of the manual and computer files used in this system. For the file symbol, I use a triangle. Each triangle has a little number down on the right side of the point. This is the standard symbol for a manual file.

In the flow chart you will find blocks of typed information. Read these in detail. Page 14 is a flowchart of the computer processing as it is done on Thursday night. The next pages, 15, 16, 17, 18 are users' documentation. This is all the documentation that a person inputting data into this system needs to run this system. The whole last page is a memo indicating the amplification of the system.

Page 15 explains how to create a fund number and assign it a title. Every one of our clerks in acquisitions has been run through a training procedure whereby they had to do everyone of these steps individually on their own. Pages 16 and 17 indicate how to create a card record for every possible transaction that can be used in this system. Obviously, we have two sets of information in this system, not including the vendor information from the business office. We have the actual information of the items we are ordering and then we have this fund structure information, that tells us where our funds are located.

Back to the handout, which we are going to go through rapidly. Page 20 explains some of the information retrieval capability of this system.

1. Data is divided into groups according to the data chart on the following page. The programs that are provided with this system can select any group of this data. Keep in mind that a systems analyst does not understand some of the things people have requested of him in detail. I could not comprehend what a new title backfile of non-serial item was, but if it was needed, I made provision for it within the system. So you can select the data by its classification of material.

2. We have a very elaborate program that does analysis of delivery cycles by vendors. It answers the question, "How long does it take us to get a particular item from the day we ordered it?" Also, we profile materials. Within the approval plan, we go by the LC classification.

This system produces information weekly that is disseminated to each university department--we produce a list that is distributed that tells them exactly what is on order and what has been delivered for them during the past seven-day period, and, in addition, they all get a copy of what has been delivered for them during the past three months.

The next two pages indicate the more than 20 programs that are in the system. This is not a program documentation list. This is just a program description list. The programs in the 50 series are the statistical analysis for the system. The next two pages talk about the development and support of a system. The processing time per title, on a yearly basis, is .075 minutes of computer clock time.

The next page indicates the amount of computer time required for developing and testing new programs. At the bottom of the page, there is a summary of the general development of these systems. The acquisition system incorporates 1,400 man hours approximatelv. The circulation system amounts to 1360 hours and the documents processing systems amounted to 700 hours.

The acquisitions information system provides two kinds of print-outs: periodic and demand. We have some basic documents we produce weekly, monthly, bi-monthly, and yearly. The print-outs you have here do not represent all the documents the system can produce. This is just a sample. Page 26 is a weekly print-out. The funds are listed by title. The library general fund has six sub-funds: approval plan, standing orders, serials, binding, reference, postage and freight. Then we have the individual college funds and our special external funds. The external funds are those provided by sources other than the state of Florida; they are usually grants or some other gifts. Through our fund structure a major department could have 999 subdivisions within it.

The next page is also a weekly product. This is the invoice list. There are four invoices on this page. You will see the vendor number, invoice number and the items contained on the invoices, the dollar amount plus invoice total,

and the total for the vendor. This is what our bookkeeper uses to check to make sure the paperwork contained with the material from the vendor is correct. A copy of this list goes to the business office.

Page 28 is really the heart of the operation. A copy of this is distributed to each department on campus. All items that are encumbered or have been paid are listed. Items that have been paid for have a slash in the date; items with hyphens are on order. The next print-out is the vendor analysis of discounts.

The next page is the LC class analysis of the acquisitions plan: The bottom of the page includes a summary of the class covered by that page. The system also accounts automatically for credits, and they are carried forward from day to day. They are automatically posted against debits for the same vendor. The listing on page 30 is a new format where we have added the order date, the paid date, and other information. Listings from here back are relatively self-explanatory.

Starting on page 41 are listings of items that are on order. Serials, new serials titles only, serials renewals, serials on order by vendor (we use this as a claim list), non-serials items on order, etc. are all listed.

The next page is the same idea for a particular fund (page 48). Have you ever wondered at the end of the year what you bought? This program produces that information in a few minutes.

This system has brought order out of chaos, speed and efficiency out of mass confusion. Our system now serves the public to the extent that other institutions both in and out of Florida have adopted it for their use. Much work remains to be done, but the system is designed to take additional features with minimum change.

NINTH DAY, June 23

CATALOGING

By

JOHN P. KENNEDY

AUTOMATING LIBRARY CATALOGING

A growing number of libraries are producing their catalogs, either in card or book form, through the use of data processing equipment. The availability of machine processable bibliographic records from the Library of Congress through the MARC Distribution Service has given great impetus to such efforts. I will describe the work at the Georgia Tech Library in this area with emphasis on the changes we are making in our system as a result of our experience with the MARC Pilot Project. Before turning to this prosaic part of the cataloging process, I would like to make a few comments about the intriguing possibilities in the more intellectual tasks of original cataloging.

There has been much interest and research on automatic indexing but so far there has been little production as distinguished from research work. Still the promise of automatic indexing is alluring. In a recent article in which he reviewed the results of work done on automatic indexing, Gerald Salton concluded:

"All the available evidence indicates that the presently known text analysis procedures are at least as effective as more conventional manual indexing methods. Furthermore, a simple indexing process based on the assignment of weighted terms to documents and search requests produces better retrieval results than a more sophisticated content analysis based on syntactic analysis or hierarchical term expansion. Such a simple automatic indexing procedure is easily implemented on present-day computers, and there are no obvious technical reasons why manual document analysis methods should not be replaced by automatic ones."[1]

Louis Kaplan, a library administrator, reacts quite differently to the same research findings:

"From these bits of evidence the relative insignificance of the indexing system and language compared to the indexing itself, and the imaginativeness of the search strategy, rises to haunt us. Furthermore, realizing that automatic indexing is not now superior to manual indexing, and guessing at the cost of this kind of indexing, the prospects are anything but bright."[2]

I suspect that in time most indexing will be done by computers rather than by human indexers but this seems to be a distant rather than an immediate prospect. A prerequisite to automatic indexing in order for it to be attractive on a large scale is the availability from publishers of the text or at least an abstract of documents in machine processable form.

During the period in which human catalogers are continuing to do original cataloging there are some ways in which the computer may be of assistance. In the report, Automation and the Library of Congress, a system is projected in which a cataloger works at a console on line to the computer and the various

authority and bibliographic files of the library. As she keys in the title page data, an edit program would normalize the data to the form of a catalog card. If the author's name matched a name already on the authority file, the computer could supply the established form of the entry. Otherwise the entry would have to be established by the cataloger and the established entry and its variants keyed in and placed on the authority file. Cataloging rules and schedules would be available and could be displayed as needed. When the displayed record was completed to her satisfaction, the record could be released for automatic addition to the bibliographic files. Thus the entire cataloging operation would be completed without retyping or creation of any paper documents.[3]

So far only a few preliminary steps have been taken along these lines. For example, at the Library of Congress and at Harvard University, subject authority files are being maintained on magnetic tape and updated by computer processing. At Harvard a computer updated subject heading list is kept at each cataloger's desk. At many libraries, including the Georgia Tech Library, bibliographic data is typed in a relatively unformatted form and a computer program formats it for printing catalog cards or book catalogs.

Key word indexing by computer is widely known through a number of published indexes. Several libraries, including the Florida Atlantic University Library which you heard about yesterday, are using key word indexing for special types of materials for which they cannot afford to do full traditional cataloging. Key word indexing has proved to be an effective technique for many types of materials, especially with manual enrichment of titles. It often provides an attractive compromise between full cataloging and no cataloging.

Having considered very briefly a few of the possibilities for atuomation of cataloging proper, I would like to proceed to consider that part of the cataloging operation that is currently being automated at numerous libraries. This is the production of the catalog record which the patron will use in the form of a file of catalog cards or in book form. The Georgia Tech Library has utilized data processing equipment for the production of most of its catalog cards for the past three years and is experimenting with the production of book catalogs. The original catalog production system at Georgia Tech has been described in a paper which has been available for you to read in the dormitory.[4] I will therefore emphasize some of the changes we have made, and the reasons for them.

In systems design one usually begins by considering the desired outputs of the system. I will begin this description of the Tech Library catalog production system by describing the outputs. The primary output of the system to date has been catalog cards. Over 400,000 cards have been produced by the system and filed into the various catalogs maintained by the Library. In order to save space on the catalog cards and thus prevent the creation of numerous extension cards

we made several modifications to the traditional unit card format. We have had no problems or complaints resulting from these changes and the number of extension cards has not been excessive. Figure 1 is part of a set of cards printed on our computer line printer. It should, perhaps, be emphasized that the variations from the traditional card format were made by choice and that a library could write its programs so that catalog cards are printed in the traditional card format.

Book catalogs were the other primary product in the system design. Our objective has been to produce the book catalogs as a part of the same operation which produces the catalog cards, in order that we might evaluate the usefulness and production costs of the book catalog without committing ourselves to discontinuance of the card catalog. We have not yet been able to evaluate the usefulness of book catalogs in our situation since we have been unable to obtain funds for their printing and distribution. We have been able, however, to develop a system for the production of the book catalogs from the same machine records that are used in producing our catalog cards. We have printed out two editions of the book catalog in a single copy and have been producing one-copy monthly supplements. A proposal for funding a project to print and distribute this catalog on microfiche is currently being reviewed.

The system is also designed to produce several secondary products. First of these is a monthly new book list. This list records all titles cataloged for the collection during the previous month and is arranged in call number order. We reproduced the list for distribution to faculty and staff for two years. Reproduction of the list has currently been suspended as an economy measure but a copy of the current list is kept at the reference desk where it may be consulted by patrons. The system was also designed to produce book cards, book pockets and spine labels. This part of the system has been tested but has not been used in regular production because of the difficulty and delays involved in matching these products with the books. We are planning, however, to try this again in the future.

Various management statistics are produced by the system. Statistical reports showing volumes, times and costs for all computer runs are produced. Reports show the hours spent in typing input records, the number of titles completed, the average number of records typed per hour, and the number of computer detected errors, for each typist. The distribution of titles cataloged is reported by such characteristics as language, subject class, location, cataloger, and method of acquisition.

The final product of the system is of a different nature from those mentioned so far since it is a means of providing other useful outputs rather than a product that is directly useful. This is the development of a machine processable file of bibliographic descriptions of our holdings. This file now contains about 44,000

SET OF MARC CARDS

TITLE

```
      ATLAS OF NORTH CAROLINA.

G1300 LONSDALE, RICHARD E.
.L6     ATLAS OF NORTH CAROLINA. DIRECTOR AND
1967  CHIEF CARTOGRAPHER: RICHARD E. LONSDALE;
```

ADDED ENTRY

```
      COLE, JOHN B.

G1300 LONSDALE, RICHARD E.
.L6     ATLAS OF NORTH CAROLINA. DIRECTOR AND
1967  CHIEF CARTOGRAPHER: RICHARD E. LONSDALE;
```

SUBJECT

```
      NORTH CAROLINA.

G1300 LONSDALE, RICHARD E.
.L6     ATLAS OF NORTH CAROLINA. DIRECTOR AND
1967  CHIEF CARTOGRAPHER: RICHARD E. LONSDALE;
```

SUBJECT

```
      NORTH CAROLINA--MAPS.

G1300 LONSDALE, RICHARD E.
.L6     ATLAS OF NORTH CAROLINA. DIRECTOR AND
1967  CHIEF CARTOGRAPHER: RICHARD E. LONSDALE;
```

MAIN ENTRY

```
G1300 LONSDALE, RICHARD E.
.L6     ATLAS OF NORTH CAROLINA. DIRECTOR AND
1967  CHIEF CARTOGRAPHER: RICHARD E. LONSDALE;
      ASSISTANTS: JOHN B. COLE [AND OTHERS]
      CHAPEL HILL, UNIVERSITY OF NORTH CARO-
```

```
G1300 LONSDALE, RICHARD E.
.L6     ATLAS OF NORTH CAROLINA. DIRECTOR AND
1967  CHIEF CARTOGRAPHER: RICHARD E. LONSDALE;
      ASSISTANTS: JOHN B. COLE [AND OTHERS]
      CHAPEL HILL, UNIVERSITY OF NORTH CARO-
      LINA PRESS, 1967. IX, 158 P. ILLUS.,
      COL. MAPS. 24 X 32 CM.

    1. NORTH CAROLINA--MAPS.
    2. NORTH CAROLINA.
       COLE, JOHN B.
       TITLE.
04/68     P   NCS:ILP ◯ ENG    MAP67-3
STI
```

SHELF LIST

STI

FIGURE 1

GEORGIA TECH

records for titles cataloged since January, 1966. Records for about 6,000 titles which were cataloged in 1966, before the mechanized system was operational, have now been punched and are being proofread and corrected. When this task is completed the file will be complete for all monographs in the collection which are classified by the Library of Congress classification, or for all monographs added to the collection since 1966 when we changed from the Dewey to the Library of Congress classification. The availability of this file opens many options for the future. As new output devices become available we will be able to take advantage of them by changing only the output module of the system, just as we are now planning to go to a Computer Output Microfilm (COM) device for output. As real time processing and mass storage devices with direct access capability become more economical, we will have the data base for providing access to the catalog from remote terminals. When we are ready to automate our circulation system, we will be able to automatically produce book cards for all books acquired since 1966, which will account for most of those with the heaviest circulation. If we need statistics not now provided by the system, on the characteristics of the monographs added to the collection, we can obtain these by running a special program to analyse the records in this file. Special purpose bibliographies may be generated with relatively little effort. All of these projected benefits depend on adequate identification of the data elements in the bibliographic record. We believe this to be provided for by the use of the MARC format. In the long run, the development of this file may be the most important benefit to the Library from the operation of the system.

Going from outputs to inputs, there are two sources of input records for the system. First, there are the MARC records obtained on the weekly tapes from the Library of Congress. At this point I think it advisable to digress in order to review the main characteristics of the MARC program for those of you who have not had a opportunity to become familiar with it.

The MARC Pilot Project which began operation in 1966 was designed "to determine the feasibility of centrally producing a standardized machine-readable record for application by local installations to serve their specific requirements". Sixteen libraries of varying types were chosen to receive the tapes from the Library of Congress during the pilot project. The Georgia Tech Library was one of these sixteen participants. On the basis of the pilot project experience it was determined that the program was feasible, and plans for a continuing distribution of machine readable catalog records were developed. In March, 1969 the Library of Congress began distribution of MARC records on a subscription basis to any libraries wishing to subscribe. At present the program covers all current English language monographs cataloged at the Library of Congress. This is averaging about 1200 titles per week. Plans call for gradual expansion to cover other categories of materials, with French and German language monographs to be covered in the first expansion. Records are usually received on the tapes at about the same time that Title II deposit cards are received for the same titles. With the introduction of cataloging in publication in 1971, MARC records should often be available before the books are published.

One of the major achievements of the MARC program at the Library of Congress has been the development of the MARC II record format which has been widely accepted as a standard. Acceptance of this format as a standardized communications format means that libraries and other organizations will be able to exchange bibliographic data without each organization having to write a special conversion program for the data from each source. If an organization has a unique format for processing and storing records, it may still exchange data with other organizations accepting the standard by writing only two conversion programs. One program is required to convert records from the MARC II format to the organization's own format and another program is required to convert from the organization's format to the MARC II format. In addition to the advantages of standardization for exchanging records, the MARC II format can provide valuable guidance to libraries in developing their own internal formats. Many libraries will wish to simplify or otherwise modify the MARC II format but knowledge of the format can save much design effort and prevent many errors and oversights in design.

We will not have time to examine the MARC II format in detail this morning but I would like to emphasize its flexibility. Flexibility was one of the prime specifications in the development of the format. There are several different types of flexibility involved. First, the basic structure is designed to be hospitable to all types of bibliographic records. It is suitable for records for such types of materials as serials, maps, and technical reports, as well as for monographs. It is suitable for index and abstract records, and for authority file records as well as for records of Library of Congress cataloging. This flexibility is achieved in part through the use of a fixed length leader field which specifies the type of material described in the record and which specifies other variable characteristics of the record. Most of the non-control information in the record is carried in variable length fields. There may be any number of these fields and the record structure provides for up to 1000 different types of variable fields. A record directory identifies the type of data in each variable field and gives its relative starting position and length. The content and coding of the variable fields can vary for different types of materials but the basic record structure remains constant.

A second type of flexibility provided by the format is flexibility in use. The records may be used for printing catalog cards, book catalogs, and special purpose bibliographies. They may be used in selective dissemination of information systems, in the selection or ordering or materials or for other purposes that may be devised to serve libraries of all types and sizes. The format is therefore designed to facilitate filing or sorting of the records according to various rules, for the printing of records in various formats, and for retrieval of records on the basis of various characteristics.

The format of the record is also flexible in its suitability for processing on a wide variety of computing systems. In a compatibility study conducted by the

Information Systems Office at the Library of Congress, "It was found that the majority of the tape units on the market are able to handle magnetic tapes conforming to the Library of Congress' standards, and that most computers are able to use at least one compatible tape unit as a standard I/O device."[5] This report may be consulted to determine whether a computing system which may be available for use by your library is capable of processing the MARC tapes.

The tremendous flexibility of the MARC format is achieved, of course, at some cost. This cost is in the complexity of the record. A simpler record could have been designed for any single use such as printing catalog cards. This would simplify programming and make processing more efficient for that particular use. Likewise, a record could be designed which would allow more efficient processing by a particular computing system. For this reason many libraries that can anticipate what equipment will be available to them and what uses they will be making of the MARC records may wish to modify the format and perhaps eliminate some data fields in order to make processing more efficient in their own situations.

The basic document describing the MARC format is The MARC II FORMAT: A Communications Format For Bibliographic Data.[6] There have been some changes since that report was issued. The briefer Books: A MARC Format[7] gives the most up to date account of the format as it is being applied for monographs. There have been a number of articles about the MARC program in the Journal of Library Automation, and the summer 1968 issue of Library Resources and Technical Services contains several articles on the MARC program. And finally for any of you who may be seriously considering the use of MARC records in your libraries, the Library of Congress and the Information Science and Automation Division of ALA have been sponsoring a series of two day institutes, held in major cities throughout the U. S., on the use of MARC records.

Returning from this review of the MARC program to consideration of the system at the Georgia Tech Library, I said that we use the MARC record as our input record whenever possible. Currently there are MARC II records available for about 60 per cent of the monographs which we are cataloging. This figure has gradually increased as the MARC data base has grown larger. We are hoping that it will continue to increase to 70 or 80 per cent. For those titles for which no MARC record is available, we key the cataloging record ourselves on a Flexowriter. The paper tape containing these records is input to a computer program which edits the data, prints a prooflisting and formats the records in a slightly modified MARC II format. Thus we get a MARC format record for all our monographs, either from the MARC tapes or by keying the record locally.

All computer processing for our system is done at the Rich Electronic Computer Center on campus. The Center has two powerful computing systems, the Burroughs B 5500 and the UNIVAC 1108. The UNIVAC 1108 was not available when

our system was initially designed and the original system ran entirely on the B 5500. Our B 5500 has two central processing units, 32,000 forty-eight bit words of core storage, 28.8 million characters of disc storage and ten 7-level magnetic tape drives. Our programs are multi-processed with other jobs and the Library is billed $140.00 per hour for processor time and $46.67 per hour for I/O channel time. The Computer Center has advised us that jobs like ours will run more efficiently on the UNIVAC 1108, and as we modify and improve the system it is being programmed for the 1108. Currently, the input programs are running on the 1108. The records are then converted to the B 5500 character set and the edit and output programs run on the B 5500. The UNIVAC 1108 has one central processing unit, 65,000 thirty-six bit words of core memory, 12 I/O channels, two high speed drums, two Fastrand drums and four 7-channel tape drives. It is being upgraded by the addition of a second central processor, 65,000 additional words of memory, and additional high speed drums and tape drives. The Library is charged $400 per hour for processor time on the 1108. Even though the MARC tapes are originally prepared on an IBM System 360 in a modified ASCII character code, we have had only minor difficulties in processing them on either the Burroughs or UNIVAC systems.

All programs for the Library system have been written in COBOL. Although COBOL has often seemed cumbersome for processing the variable length data, it does have all of the essential capabilities. We have found it more efficient to use assembly language or FORTRAN subroutines for a few operations. On the 1108, the assembly language subroutines permit the writing of true variable length records and give greater flexibility when I/O errors occur.

Figure 2, in four parts, is a flow chart of the original system. In this original system, a clerk in the Catalog Department checked a listing of LC card numbers of those records available on a cumulative MARC file to determine whether MARC records were available for the books being cataloged. If a MARC record was available the LC card number was punched into a selection cards. These cards were batched and run against the cumulative MARC file in order to select the desired records from the cumulative file. The selected records were listed, proofread, and corrected or modified as required. The corrected records were then used to print catalog cards, to update a master file of our holding and to update print files. The print files were used in a cycle of programs for printing book catalogs and supplements. If a MARC record was not available, the record was typed on a Flexowriter, catalog cards were produced on the Flexowriter, and a byproduct paper tape used as input for updating the master file and print files.

CATALOG PRODUCTION SYSTEM
PART 1: PRELIMINARY STEPS

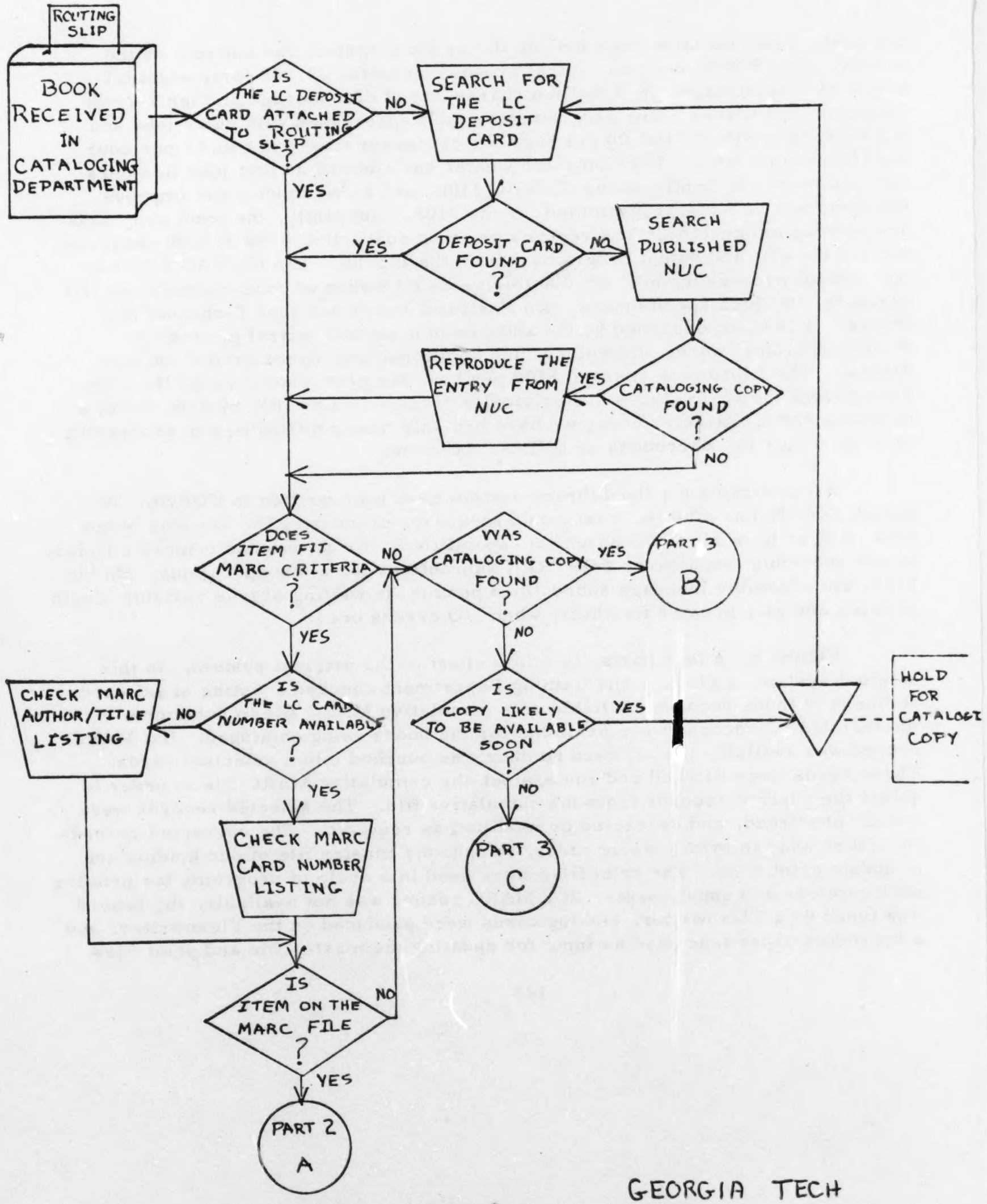


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FIGURE 2

CATALOG PRODUCTION SYSTEM
PART 2: MARC CARD PRODUCTION

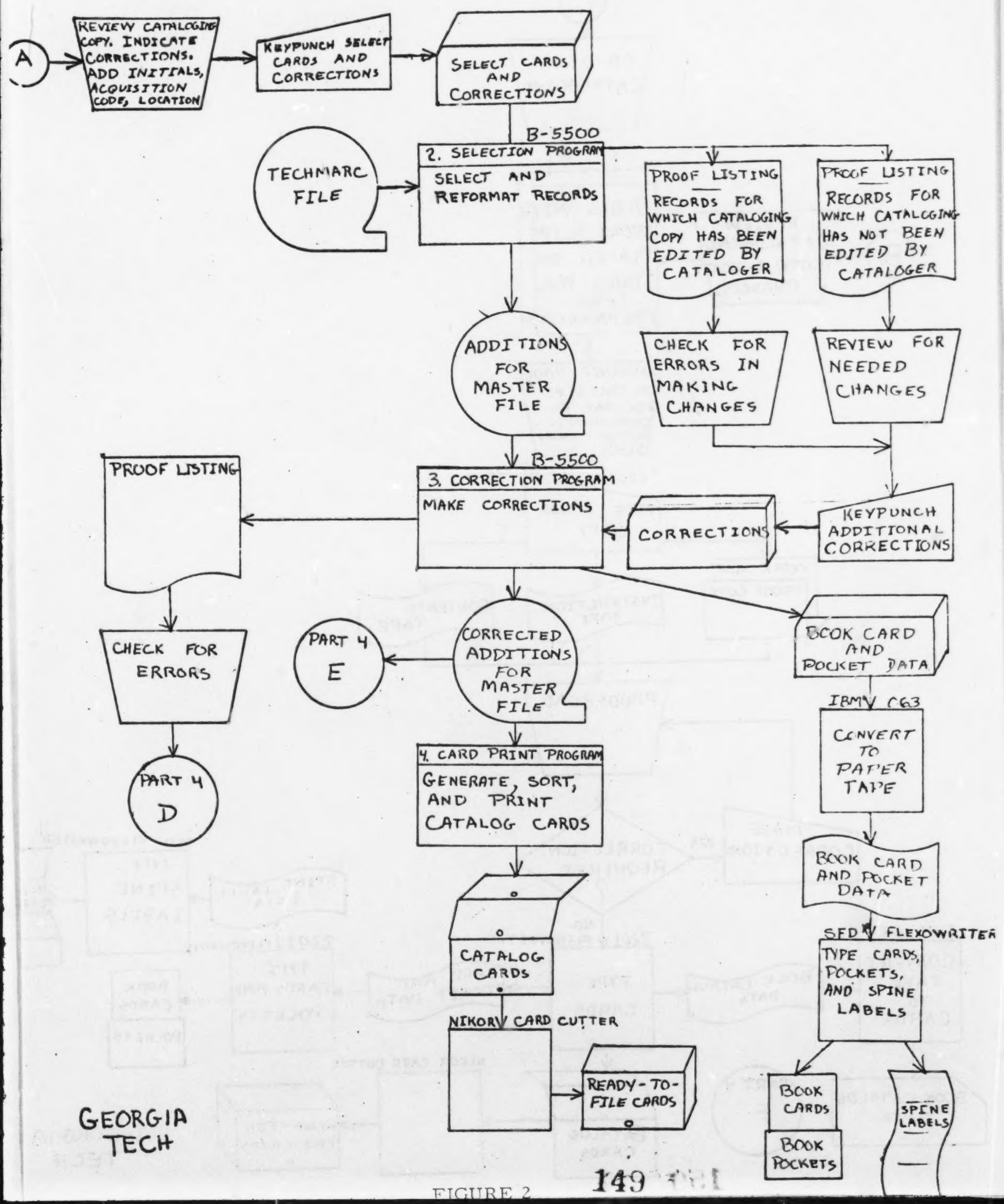

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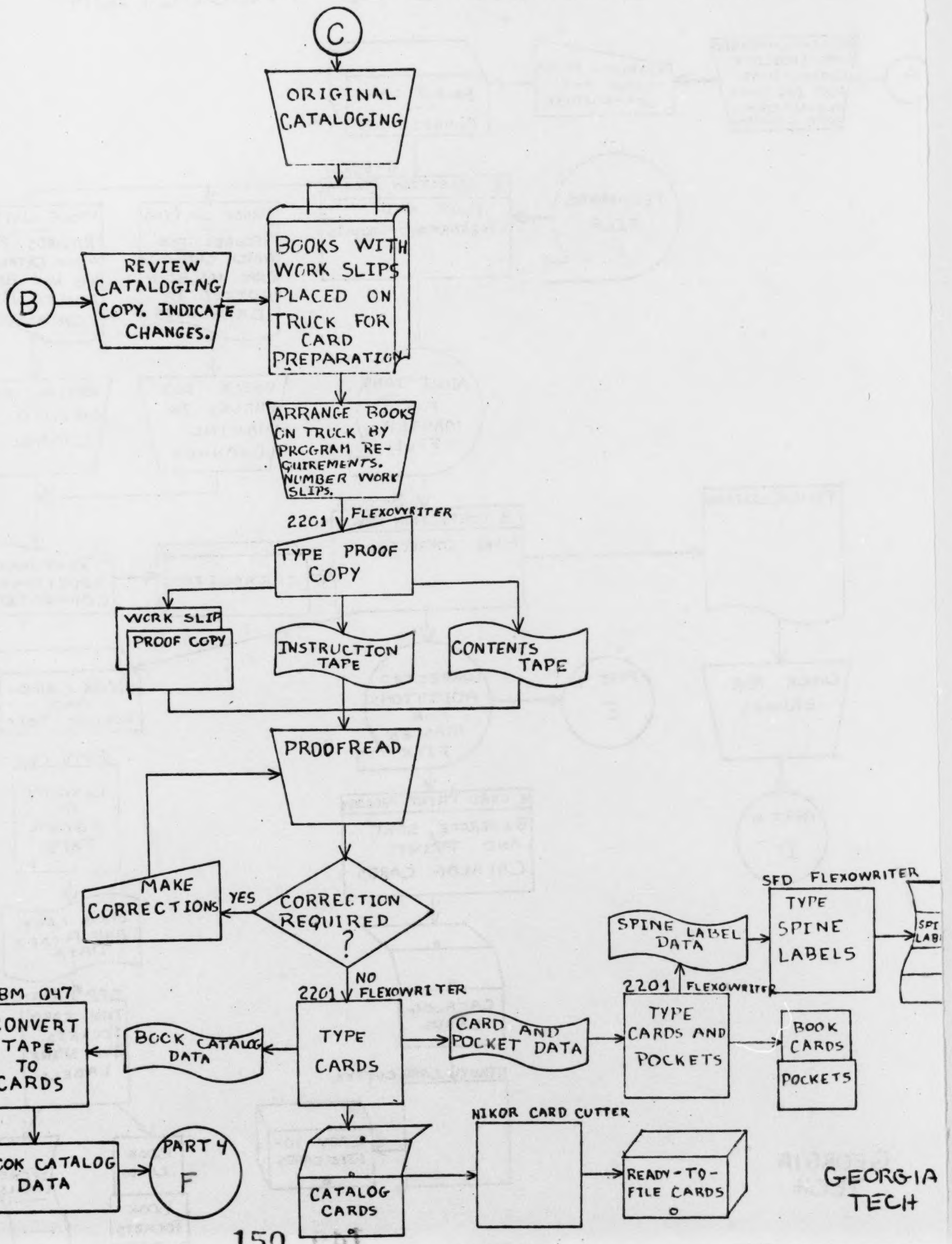
FIGURE 2

CATALOG PRODUCTION SYSTEM
PART 3: FLEXOWRITER CARD PRODUCTION



CATALOG PRODUCTION SYSTEM

PART 4: BOOK CATALOG PRODUCTION

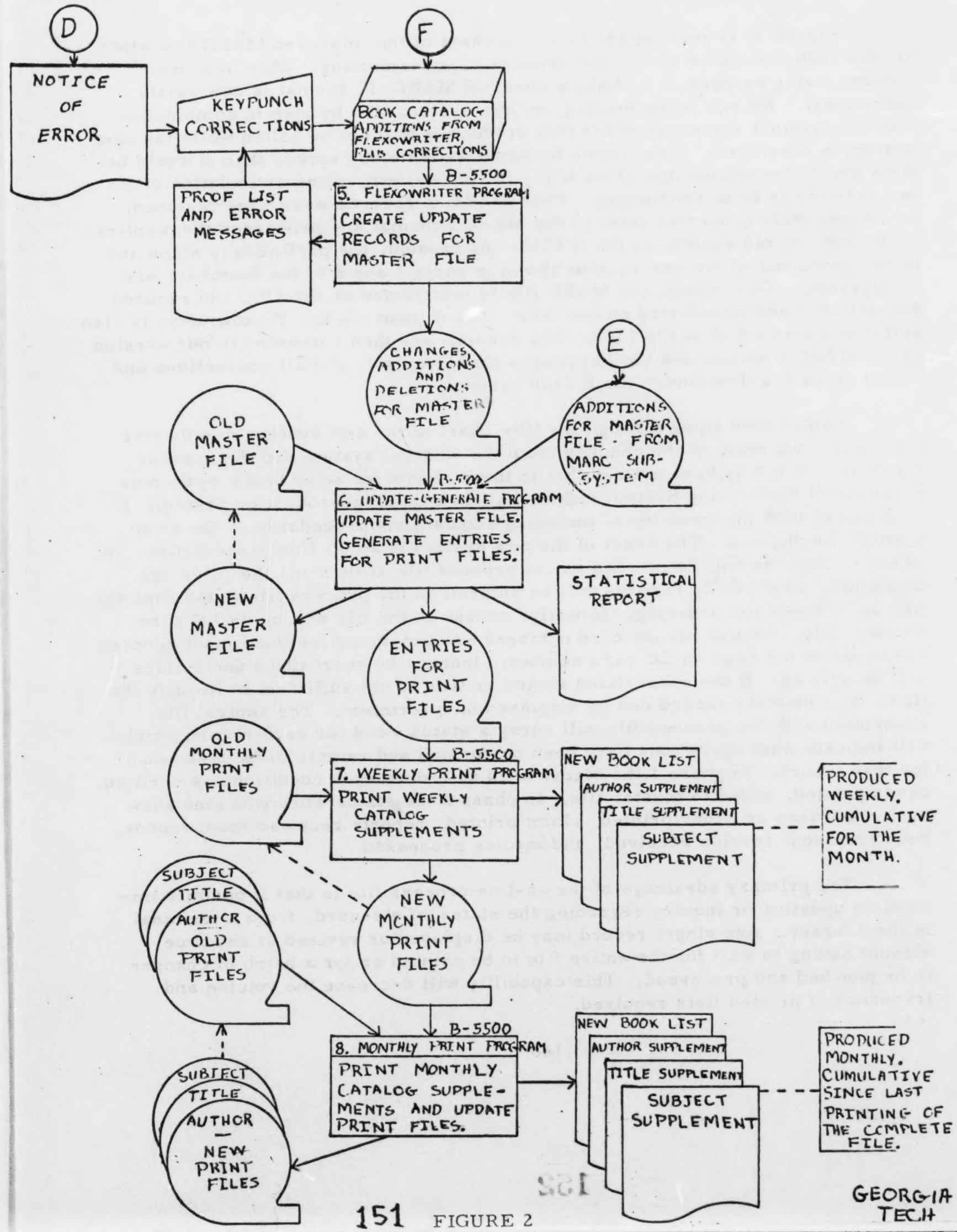


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Figure 3, in four parts, is a flow chart of the improved MARC II system for the 1108, which we are in the process of implementing. This improved system, using records in a slightly modified MARC II format is now partly operational. We are implementing the new system step by step in combination with the original system in order that production will not be halted while the new system is developed. This makes implementation much slower than it would be if we could discontinue operation of the B 5500 system, since articulation of the two systems is time consuming. When MARC II records were first received, we immediately converted them to the MARC I format and processed them entirely through the old system on the B 5500. At present, the preliminary steps and input operations of the new system shown in parts 1 and 2 of the flowchart are in operation. Our cumulative MARC file is maintained on the 1108 and records are selected and prooflisted on the 1108. Local input via the Flexowriters is also edited and formatted on the 1108. The records are then converted to our version of the MARC I format and the Burroughs character set, and all corrections and output steps are done under the B 5500 system.

Rather than going through the flow chart of the new system step by step, I will point out some of the changes from the original system and the reasons for them. You may have noticed that in these charts we refer to the system as a Technical Processing System rather than as a Catalog Production System. It is designed with the intention of including acquisitions procedures in the same system, as phase 2. The heart of the new system is an on-line process file. In phase 1, records will be entered on the process file at the time the titles are cataloged. In phase 2, records will be entered on the process file at the time the title is selected for ordering. Initially, access to the file will be by LC card number only. Unique pseudo card numbers are generated for local input records where we do not have an LC card number. Indexes by short titles and entries will be printed. If the abbreviated author or title is not sufficient to identify the item, the complete record can be displayed on a terminal. The control file associated with the process file will carry a status word for each record which will indicate what operations have been performed and remain to be performed for that record. In phase 1 the status word will show such conditions as verified, cards printed, added to master file. In phase 2 the status word will also show such conditions as order printed, claim printed, reports received from vendor, book received, invoice received, and invoice processed.

The primary advantage of the on-line process file is that it permits immediate updating or inquiry regarding the status of a record, from a terminal in the Library. Any single record may be displayed or revised at any time without having to wait for the entire file to be printed or for a batch of changes to be punched and processed. This capability will decrease the volume and frequency of printed lists required.

MARC II TECHNICAL PROCESSING SYSTEM (PHASE 1)

PART 1: PRELIMINARY STEPS AND LOCAL INPUT

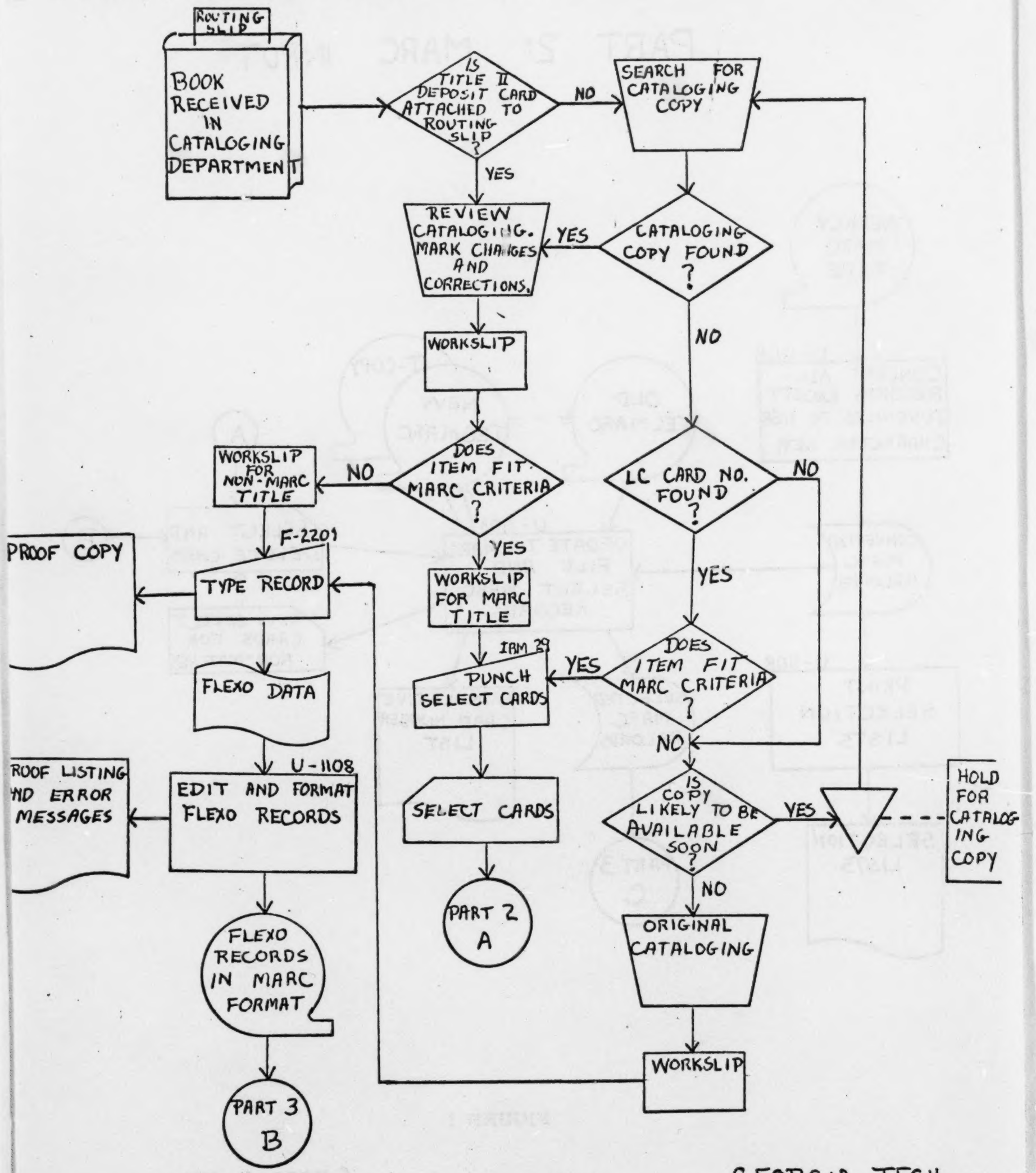

FIGURE 3

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MARC II TECHNICAL PROCESSING SYSTEM (PHASE 1)

PART 2: MARC INPUT

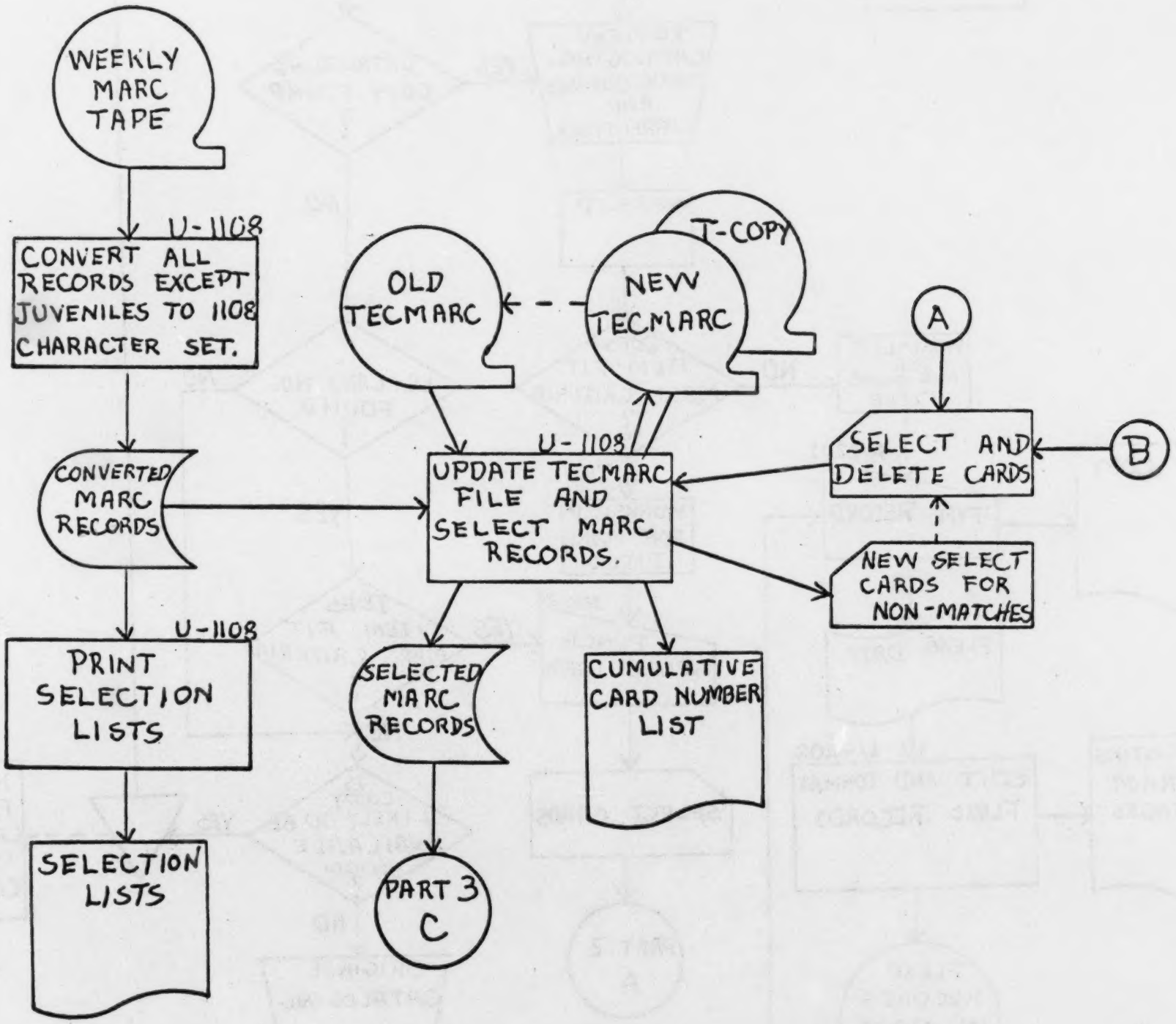

FIGURE 3

MARC II TECHNICAL PROCESSING SYSTEM (PHASE 1)

PART 3: PROCESS FILE AND MASTER FILE

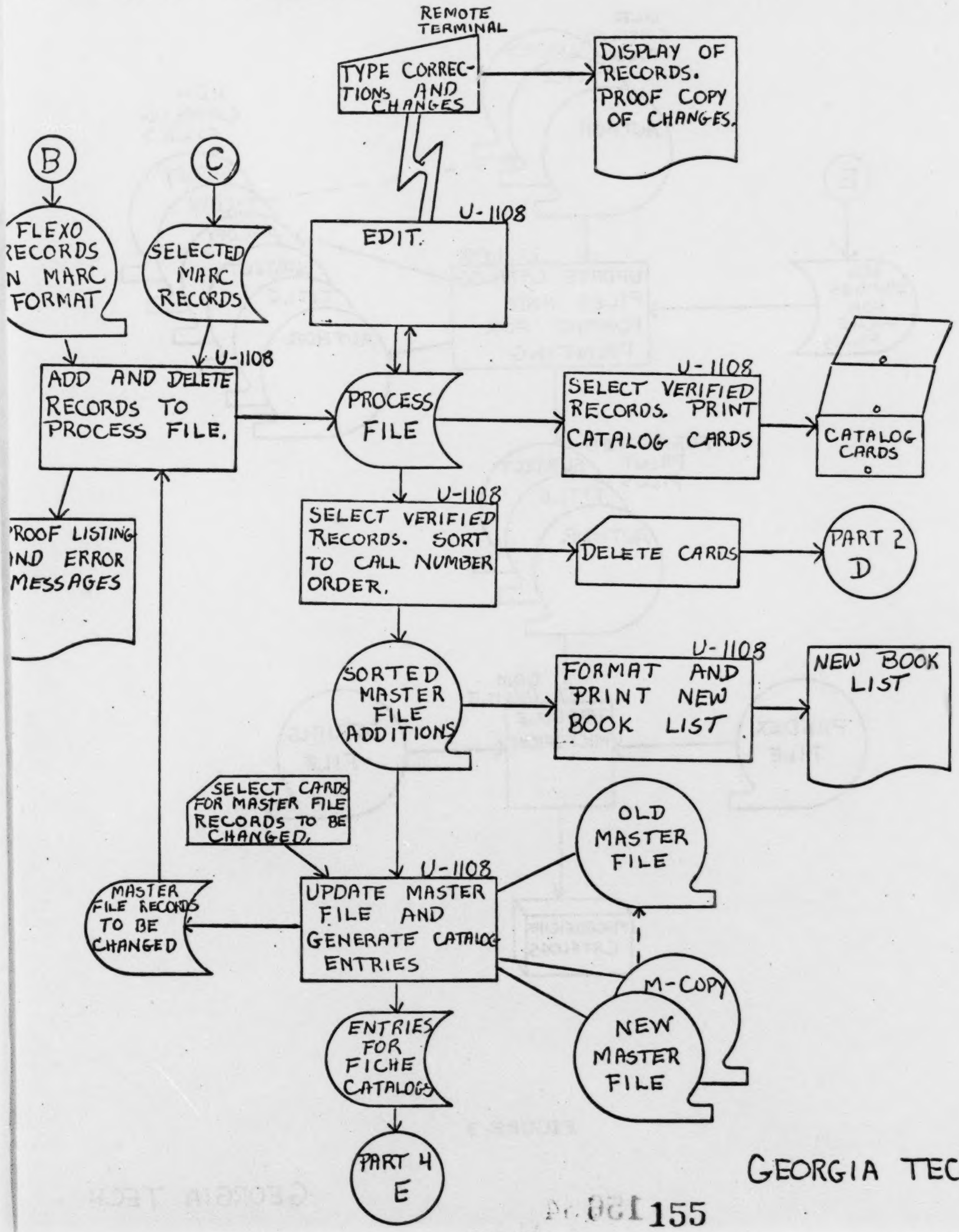

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FIGURE 3

MARC II TECHNICAL PROCESSING SYSTEM (PHASE 1)

PART 4: MICROFICHE CATALOG PRODUCTION

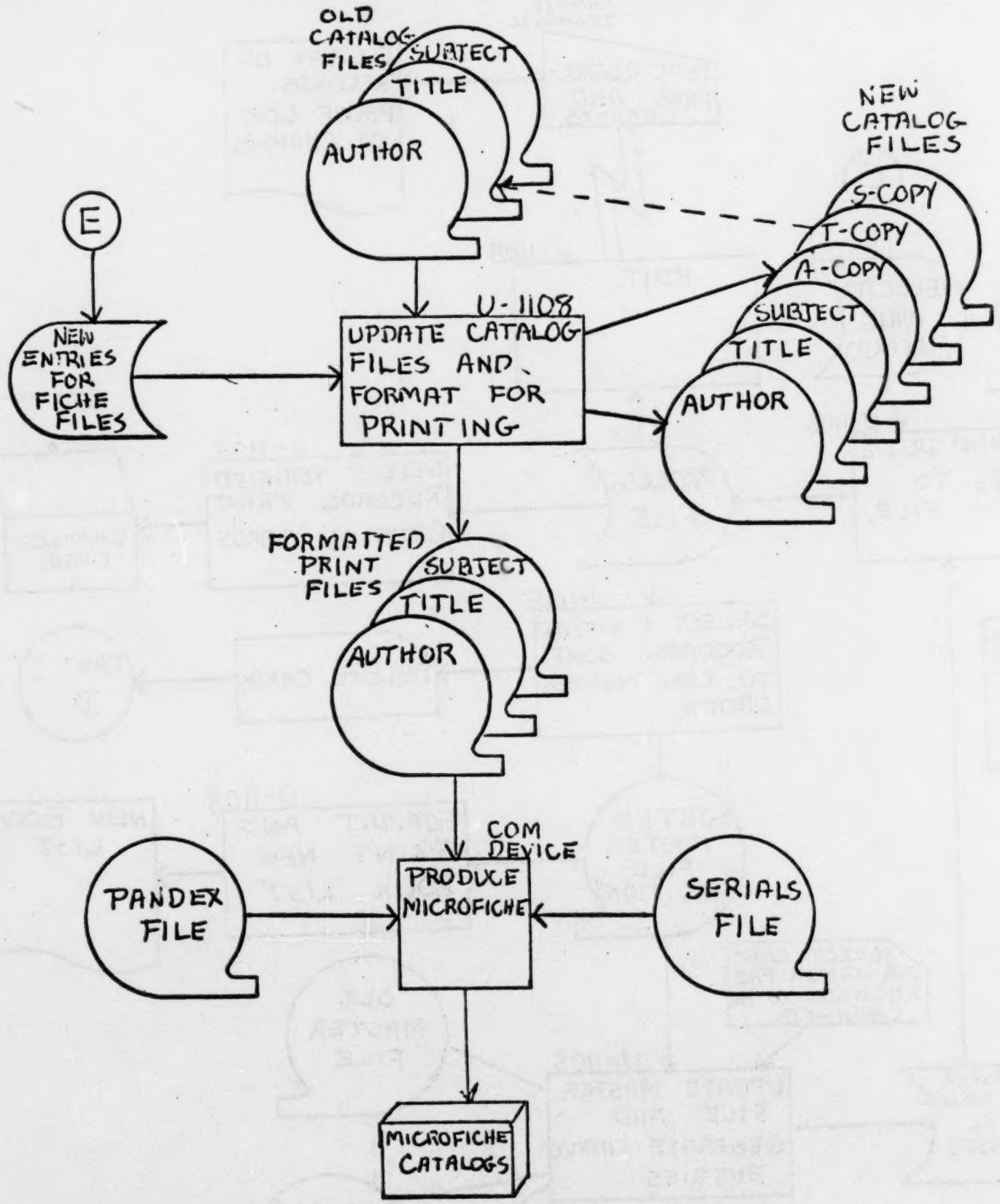

FIGURE 3

One of the most severe limitations of the original system has been that it is entirely a batch system. Records are input in batches and remain in these same batches until all processing is completed. This has extended the throughput time much beyond that which we had expected. The system was designed for a weekly cycle. We expected to pick up records from the Catalog Department once a week and to select or key these records, proofread them, make the required corrections, print the catalog cards, and update the master file before picking up the next weekly batch. This has proved to be unrealistic. The greatest delay comes in the proofreading and correction steps. We never succeed in getting all records correct on the first run of the correction program. Consequently, the prooflisting from this run must be checked and additional corrections punched before rerunning the correction program. This cycle must often be repeated several times before all records in the batch are correct and processing of the batch can be completed. In the new system, processing of a single record can continue as soon as that one record receives the verified status.

In working toward the new system, we have modified the original B 5500 system to permit display and correction of records from a terminal for corrections for about 18 months. This capability has improved throughput time and is a great convenience. When a large number of corrections are to be made, however, it is several times more expensive to do them from the terminal than by batch processing. For this reason, the initial corrections of local input records are still done in batch mode, but MARC records, with fewer changes to be made, are corrected entirely from the remote terminal. In the new system we are planning to make all changes via the terminal. The remote update program is being written so that less typing is required to make changes and we hope that it will be more efficient and more economical. Provision will also be made, however, for making corrections by batch processing if this proves to be necessary.

The only noteworthy difference between the two systems in the preliminary procedures is that the card number listing is no longer checked to determine whether a record is on the MARC file. If the book is an English language monograph with a recent imprint and is not in one of the subject classes which we delete from our MARC file, we assume that it will be on the MARC file and attempt to select it. In recent weeks 80 per cent of the records have been on the file the first time we attempted to select them. If the record for a title is not on the MARC file when we attempt to select it, the select program punches a new select card for it. These cards are combined with the new select cards on the next selection run. The program punches in the new select cards the number of unsuccessful attempts to select that record. After the ninth unsuccessful attempt a new select card is not punched but a message is printed that the title should be processed through the local input system. This means that we will ordinarily wait about nine weeks for a record to turn up on the MARC file before keying it ourselves. I do not yet have accurate statistics on the frequency with which this occurs.

The procedures for keying local input records proved to be the least satisfactory part of the original system. Initially, catalog cards for titles that were not represented in the MARC file were produced on Flexowriters and a by-product paper tape was used for adding these records to our master catalog file and print files. Use of the Flexowriters for printing catalog cards provided a larger character set including lower case and the common diacriticals, and also permitted printing 12 characters to the inch rather than 10. There proved to be several disadvantages. The Flexowriters were slower and had much more time out of service for repairs than we had anticipated. The instructions for typing records were quite complex and it usually required about two months before a new typist became proficient. Some typists were never able to follow the instructions consistently and continued to make frequent mistakes. These difficulties were compounded by a high turnover rate for typists. On the other hand, we experienced no complaints or problems from the use of the limited character set on the computer printed catalog cards. Therefore, we decided to print all catalog cards on the computer and to use the Flexowriters strictly as an input device. Used in this manner, the Flexowriters have proved to be quite reliable and seldom in need of repair. Since program codes to control the automatic typing operations on the Flexowriter are no longer required, the typing procedures and instructions have been simplified. The data may be input in a relatively unformatted form as long as each data item is identified with the correct MARC tags. Corrections can be made much more conveniently since the incorrect codes may be left in the paper tape and additional codes punched to cause the data to be corrected by the computer under control of the editing program. The input of local records takes only about half as long under the improved system.

Our experience has shown that the major machine costs for operating the system do not result from the processing of records required for character conversion, editing, formatting entries, sorting and printing but from the reading and writing of several large files. The large magnetic tape files required by the system are the master catalog file, the catalog print files, and the cumulative file of MARC records (referred to on the flowcharts as the TECMARC file). All of these files are multi-reel files, presently requiring three to five tape reels each. Not only are the runs that update these files expensive but occasionally in such large files there are records on the tapes that cannot be read. This has occurred more frequently on the B 5500 than on the 1108. Nevertheless, it has been enough of a problem on both computers that we are now maintaining duplicate copies of each of these files. This adds to the cost of update runs for these files but it has been effective in preventing the necessity of reconstructing the files from older backup tapes.

In the original design, the complete print files were updated only once a month but the master file was updated weekly. We have found it more economical to merge several of the tapes for updating the master file and to run the update program only twice a month rather than weekly. In the new system the programs which update the master file and catalog print files, will be run only

once a month. This will limit the cost of these runs. Also we plan to segment these files in five year volumes so that they do not continue to grow indefinitely. This will lead to the production of catalogs divided chronologically into five year sections as is the printed National Union Catalog.

Maintenance of the TECMARC file and selection of records from the TECMARC file are still done weekly in order to avoid unnecessary delay in producing catalog cards. During the MARC Pilot Project we did not find it necessary to update the TECMARC file weekly since the Library of Congress provided cumulative tapes. In the original system, therefore, selection of records was done in a separate program. These functions have been combined in the same program in the new system so that it is necessary to read the TECMARC file only once a week. We have found that it costs us approximately $ .00068 per record to read or write a file of MARC records. Our TECMARC file currently contains 54,400 records so it costs about $37 to read this file and $74 to read it and write an updated version of it. Table I shows our calculated cost per title for reading the TECMARC file, selecting records from it and formatting these records for printing. The cost per record depends on both the number of records in the TECMARC file and the number of records selected in each batch. Table II shows the calculated cost per title when file maintenance is included in the same run. Obviously, it is important to keep this file as small as possible and to avoid any unnecessary passes of the file. We are averaging about 250 titles in the weekly select batches and the TECMARC file contains about 54,400 records. Table II indicates a cost per title of about $ .37 at these volumes. If the cost of these functions goes much higher, the system becomes uneconomical. We cannot increase the size of batches at our current acquisitions rate without delaying cataloging. Therefore, we have been working on techniques for limiting the size of the TECMARC file. Analysis by subject class of records received in the MARC Pilot Project and of reeords which we selected for use showed that we used more than 50 per cent of the records in some classes and less than 1 per cent in other classes. We determined that it would be more economical for us to eliminate from the TECMARC file, records in those classes in which we use a small percentage of the MARC records. The local input system via the Flexowriters can be used for the relatively few titles we catalog in those classes. The new program for updating the TECMARC file permits the specification of classes that will not be added to the file. Twenty-nine subject classes, such as BV (Practical Theology), CS (Genealogy), RD (Surgery), SF (Veterinary Medicine), and TX (Domestic Science), are currently being omitted from the TECMARC file.

We also analyzed the records which were selected from the file to determine how long they remained on the file before being selected. The distributions of times showed significant variation from one subject class to another. Generally, it appeared that in those subject classes in which we selected a small proportion

RELATIONSHIP OF FILE SIZE AND BATCH SIZE TO COST PER TITLE

$$C_T = \left(\frac{FS}{BS}\right) C_R + C_P$$

C_T - Cost per title
FS - File size
BS - Batch size (number of records selected from the file)
C_R - Cost per record read = $.00068
C_P - Cost per record processed = $.073

FS \ BS	50	100	150	200	250	300	400	500	750	1000
10,000	.209	.141	.118	.107	.100	.095	.090	.087	.082	.080
20,000	.345	.209	.164	.141	.127	.118	.107	.100	.091	.087
30,000	.481	.277	.209	.175	.155	.141	.124	.114	.100	.093
40,000	.617	.345	.254	.209	.182	.164	.141	.127	.109	.100
50,000	.753	.413	.300	.243	.209	.186	.158	.141	.118	.107
60,000	.889	.481	.345	.277	.236	.209	.175	.155	.127	.114
70,000	1.025	.549	.390	.311	.263	.232	.192	.168	.137	.121
80,000	1.161	.617	.436	.345	.291	.254	.209	.182	.146	.127
90,000	1.297	.685	.481	.379	.318	.277	.226	.194	.155	.134
100,000	1.433	.753	.526	.413	.345	.300	.243	.209	.164	.141
110,000	1.569	.821	.572	.447	.372	.322	.260	.223	.173	.148
120,000	1.705	.889	.617	.481	.399	.345	.277	.236	.182	.155

TABLE I

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RELATIONSHIP OF FILE SIZE AND BATCH SIZE
TO COST PER TITLE - FILE UPDATE AND
RECORD SELECTION FUNCTIONS COMBINED
IN SAME PROGRAM

$$C_T = \left(\frac{FS_O + FS_A + FS_D + FS_N}{BS}\right) C_{IO} + C_P$$

C_T - Cost per title
FS_O - File size, old file
FS_A - File size, add records = 1200
FS_D - File size, delete records = 1200
FS_N - File size, new file
BS - Batch size (number of records selected from file)
C_{IO} - Cost per record read or written = $.00068
C_P - Cost per record processed = $.073

FS_O \ BS	50	100	150	200	250	300	400	500	750	1000
10,000	.378	.225	.175	.149	.134	.124	.111	.104	.093	.088
20,000	.650	.361	.265	.217	.188	.169	.145	.131	.111	.102
30,000	.922	.497	.356	.285	.243	.214	.179	.158	.130	.115
40,000	1.194	.633	.447	.353	.297	.260	.213	.185	.148	.129
50,000	1.466	.769	.537	.421	.352	.305	.247	.212	.166	.143
60,000	1.738	.905	.628	.489	.406	.350	.281	.240	.184	.156
70,000	2.010	1.041	.719	.557	.461	.396	.315	.267	.202	.170
80,000	2.282	1.177	.809	.625	.515	.441	.349	.294	.220	.183
90,000	2.554	1.313	.900	.693	.569	.486	.383	.321	.238	.197
100,000	2.826	1.449	.991	.761	.624	.532	.417	.348	.257	.211
110,000	3.098	1.585	1.081	.829	.678	.577	.451	.376	.275	.224
120,000	3.370	1.721	1.172	.897	.732	.622	.485	.403	.293	.238

TABLE II

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of the records on the file, we tended to acquire those books more rapidly. This indicates that unselected records in those subject classes might be purged from the file after a relatively short time, perhaps six months. Unselected records in the subject classes in which we eventually select a large proportion of the records might profitably remain on the file for a longer period, perhaps a year or eighteen months. The new program for updating the TECMARC file will purge from the file those records which have been on the file longer than a period which can be specified for each subject class. We have not yet purged the file on this basis. This fall the oldest MARC II records will have been on the file for eighteen months and we will do another analysis to determine whether our findings on the use of the MARC Pilot Project records also hold true for the MARC Distribution Service records. Since the coverage of the MARC Distribution Service is broader than that of the Pilot Project and since more of our books are now being received automatically on approval plans, the patterns may be significantly altered. Through this analysis we will attept to determine the optimal time for unselected records in each class to remain on the file, and we will then begin purging the file on this basis.

Obviously, the time that records need to remain on the file, and therefore the size of the cumulative file, are related to the acquisitions policies and procedures of the library. At the University of Chicago Library, the MARC tapes are used for the selection and ordering of monographs as well as for a source of cataloging data. Since they are considering records for use soon after they are received they have found it unnecessary to retain records on their cumulative MARC file for more than three months. Our new system provides for the printing of selection lists from the weekly MARC tapes. These lists will be distributed to staff members and faculty having responsibility or interest in book selection in various subject areas. The checked lists will be used for initiating orders and the orders will be printed from the records in the TECMARC file. Hopefully, this will help to insure the early selection of books to be acquired, and unselected records may then be purged from the TECMARC file after a shorter period.

In the output module of our system the major change is in the media in which the catalog will be produced. I mentioned earlier that we have been producing book catalogs and supplements on the computer printer but have not had funds to reproduce and distribute these catalogs for use. We have considered three reproduction methods for the book catalogs. One method is to print the catalog on the computer printer, photographically reduce each page and print by offset printing. A second method is to produce a magnetic tape which can control a photocomposition device to produce the formatted pages and again print on an offset press. This method permits the use of a larger character set with various type styles and sizes, produces a more visually attractive page and permits much greater density of entries on the page. We estimate that using unreduced computer output we average 14 entries per page, with photo-reduced computer output we average 25 entries per page and that with photocomposition we might get up to 65 entries per page.

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Until quite recently price quotations we had received for photocomposition would have made it significantly more expensive than the use of reduced computer output even though the number of pages to be printed and collated would be decreased by more than half. Prices for photocomposition work have been decreasing, however, as more firms enter this field. A recent estimate we received would produce a lower overall cost using this method.

A third method which we have considered for producing our book catalogs is the use of Computer Output Microfilming (COM). In this method, a computer tape drives a COM device which creates page images on microfilm. In our case we would use the microfilm to produce multiple sets of microfiche. Of course, strictly speaking, the product will not be a book catalog. Nevertheless, the catalog will contain exactly the same data in the same arrangement as our book catalog would have. It would even be possible to use the same tapes to drive either the computer printer or the COM device, producing entries in exactly the same format. We will actually revise our print program to take advantage of special features of the COM device selected. Various reduction ratios may be obtained in the film output of the COM devices. A reduction of 42X permits up to 208 page images containing about 3,000 catalog entries on a single fiche. A reduction of 28X permits 96 page images containing about 1400 entries per fiche, and a reduction of 24X permits 80 page images with about 1150 entries per fiche. Duplicate fiche in the projected quantity cost about $ .10 to $ .12 each. Production of the original costs about $20 per thousand page images and is not affected by the reduction ratio selected. Table III presents a comparison of the catalog size and costs for these three production methods using our projected volumes. It shows a cost ratio of at least 9 to 1 in favor of the microform catalog. By using a higher reduction ratio a greater saving could be achieved but with a loss of compatibility among the various microfiche in use in the Library.

The proposal which we have submitted for the funding of our microfiche catalog calls for other files to be distributed on microfiche as well. The existing card catalog will be filmed and reproduced on microfiche to form the basic fiche catalog which will be updated monthly by the COM produced supplements. Our serials holdings file will also be distributed on COM produced microfiche. These three sets of fiche will give a record of the monographic and serial holdings of the Library. The PANDEX Current Index to Scientific and Technical Literature which we are receiving on magnetic tape will also be used to produce COM microfiche for distribution. This set of fiche will provide indexing of about 1900 of the most important journals, 35,000 government technical reports and 6,000 books in scientific and technical fields annually. These fiche would also be distributed monthly and would cumulate for one year. The proposal calls for distribution of 46 readers and complete sets of fiche on campus and 6 sets without the PANDEX fiche off campus. Telephone and campus delivery service would be provided as well as free copying of articles, for faculty members.

GEORGIA TECH LIBRARY
ESTIMATED VOLUMES AND COSTS FOR CATALOGS IN BOOK FORM AND MICROFORM

DATE	NUMBER OF TITLES	PHOTO COMPOSED PAGES (65 ENTRIES)	LINE PRINTER PAGES (25 ENTRIES)	MICROFICHE			COST FOR 100 COPIES					
				42X (208 IMAGES, 2912 ENTRIES)	28X (96 IMAGES, 1344 ENTRIES)	24X (80 IMAGES, 1120 ENTRIES)	PHOTO COMPOSITION AND OFFSET PRINTING[1]	OFFSET PRINTING FROM REDUCED LINE PRINTER COPY[2]	COM MICROFICHE[3]			
									COST OF ORIGINAL	42X	28X	24X
1970 JUNE	43000	2647	6880	60	128	154	$13235	$17200	$246	$ 906	$1654	$1940
DEC.	52600	3237	8416	73	157	188	16185	21040	301	1104	2028	2369
1971 JUNE	62200	3828	9952	86	186	223	19140	24880	356	1302	2402	2809
DEC.	72400	4456	11584	100	216	259	22280	28960	414	1514	2790	3263

1. Photocomposition and offset printing estimated at $5.00 per page.
2. Offset printing from reduced line printer copy estimated at $2.50 per page.
3. Cost of microfiche estimated at $20.00 per thousand pages for production of master copy plus $.11 per fiche for duplicates.

TABLE III

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I will conclude with a brief evaluation of the system. We have had no problems or complaints from patrons or service librarians resulting from the use of the computer produced catalog cards. The proposed distribution of the book catalog on microfiche and the related services offer the promise of a convenience to users that has not previously been offered in large academic libraries. Although we have temporarily had to discontinue distribution of the new book list, it was a service that some but not all of our faculty found helpful. Our catalogers have had some difficulties and objections to the frequent changes in procedures that have accompanied the development of the system but are generally pleased with its operation.

We do not have good current cost figures because of the frequent changes and the inefficiencies involved in converting from one system to another. Table IV summarizes the costs of producing catalog cards on the B 5500 system during the spring and summer of 1968. The $ .11 per card cost compares favorably with the $ .17 per card which an earlier study showed that it had been costing us to use Library of Congress printed cards. Perhaps more significant is the increase in number of titles cataloged without a corresponding increase in staff. In 1965-66 8,000 titles were cataloged with cards purchased from the Library of Congress, when available, and prepared on Flexowriters when not available from L. C. In 1969-70 almost 20,000 titles were cataloged, with cards for all monographs produced by the computer. This was done with no increase in the number of clerical employees in the Catalog Department although two additional catalogers have been employed. The equivalent time of one full time position is required in the Data Processing Department for operation of the catalog production system.

On the other hand, development of the system has been expensive. Computer time and salaries for development of the original system totalled about $35,000. Modifications to the original system and work on the improved system have required about $60,000 to date. The design and programming effort for the book catalog has been much greater than that required for catalog cards. A system designed to produce catalog cards only could be developed at much less expense and could be operated more economically. Also, now that the MARC II format has been developed and well documented and a number of libraries have experience with its use, a catalog production system might be developed at less expense. Nevertheless, I think that these figures indicate that it will be uneconomical for small and medium size libraries to develop their own systems. The figures in Table II showing the relationship of the cost per title for maintaining a cumulative MARC file and processing records from it to the size of the file and the number of records selected from it in a batch, lead to the same conclusion. It will not be economical for the small or medium size general library to use MARC records in a system requiring maintenance of a cumulative MARC file. Unit costs may be quite attractive, however, when the costs of maintaining the file can be apportioned to a large number of records used. This would indicate that the very large library may benefit directly through the use of MARC records in an automated system but that the small and medium size libraries are likely to benefit only through processing centers serving a number of libraries.

SUMMARY OF CARD PRODUCTION COSTS

		AVERAGE COST PER TITLE
LABOR		$ .30
SUPPLIES AND EQUIPMENT		.14
COMPUTER TIME		
FILE MAINTENANCE RUNS	$.04	
SELECT RUN	.28	
CORRECTION RUNS	.02	
CARD PRINT RUN	.07	
TOTAL COMPUTER RUNS		.41
TOTAL COST		$ .85
AVERAGE NUMBER OF CARDS PER TITLE	8	
AVERAGE COST PER CARD	($.85/8)	$ .11

TABLE IV

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AUTOMATED CIRCULATION SYSTEM

By

GERRY D. GUTHRIE

AUTOMATED CIRCULATION SYSTEM

INTRODUCTION

This discussion will cover four separate subjects. First, there will be a preliminary discussion of the steps in development of the Library Circulation System. Some of these steps have been covered in an earlier session but I will try to show unique problems that we encountered in the development of the Ohio State University Circulation System. Secondly, we will talk about the four general types of automated circulation systems that are operating in the United States today. Thirdly, we will go into detail on a sample batch-mode system describing the various computer runs that compose the system. Fourthly, I will describe very briefly the Ohio State University Circulation System and general innovative developments in library automation. Very little time will be spent on the O. S. U. system as it would only be appropriate to the large institutions.

I have various illustrative materials which I will pass around the class; of particular importance are the bibliographies.

PROBLEMS ENCOUNTERED IN THE DEVELOPMENT OF AUTOMATED SYSTEMS

Starting with the first step in the development of the circulation system we have the determination of objectives. The institutional objectives must be taken into consideration and coordinated with the library objectives. It is sometimes difficult to get a clear cut definition of the objectives of library automation. At O. S. U. the library administration determined that an automated approach to a circulation system would provide the greatest user benefit. Thus, our system is primarily user oriented and is not merely an improvement of internal library operations which would benefit primarily librarians.

Objectives may also be considered in terms of long term and short term benefits. Our long term objective is to develop a totally integrated library system, while our short term objective is to develop the automated circulation segment.

One problem rarely discussed is the difficulty of getting administrative support for a program in automation. Perhaps this problem is unique to a large institution, but I think not. In any automation project you are normally going to need some new funds. It is very difficult to arrange for development of a system out of an existing library budget without having ongoing operations suffer.

The first step in the actual development of a system is a detailed system analysis of the existing manual operation. In a small library and for a relatively unsophisticated automated system this may not be necessary, but the more complicated the activity, the more necessary this becomes. A systems analysis includes procedures, files used, personnel organization, and forms. One discovery in our analysis was the number of small files which had developed over the years in the Circulation Department. These files were normally stored in old shoe boxes and were used for a wide variety of purposes. Typical of these "shoe box" files were snag files, lost book files, problem files, etc. Each of these "shoe box" files served some specific purpose however, and we generally had to accommodate the activity in our eventual design.

The actual design of an automated system should be preceeded by visits to similar sized institutions with operating automated systems. This should be accompanied by a thorough review of the literature on existing systems design. The real meat of the systems design is the development of a top level systems flow chart and the writing of detailed program specifications. At O. S. U. we spent very little time looking at the various problems associated with computer hardware. We were told what hardware we had available and considered it an environmental parameter in which we had to work. Once the design is complete, you can then establish detailed work schedules.

In the time scheduled for the actual writing of the computer programs you should accommodate time for coding, testing individual programs, and testing the entire system. The amount of time spent on the latter step, systems testing, will be reflected in the smoothness of your conversion to an automated system.

The first step in the implementation of an automated circulation system is file conversion. This can be an exceedingly complex problem. At O. S. U. we converted our entire shelf list of over 700,000 titles with the average of 88 characters per title. The actual conversion to machine readable form was performed by an outside vendor. The vendor, a computer service bureau, specialized in library file conversions. The vendor supplied us with edit listings which were then proofread by library personnel. Corrections were then posted to the vendor tapes and the final corrected tape was then delivered to the library. The vendor, with a staff of 20 typists, spent three months in the conversion of the file. Our total expenses will be close to $100,000.00; or roughly 14.3¢ per title.

At this point I will have to stop as at O. S. U. we have just completed our file conversion and I can no longer speak from first hand experience.

TYPES OF CIRCULATION SYSTEMS

The four types of circulation systems that I will be discussing are the unit record system, the batch-mode system, the on-line data collection system, and the on-line catalog access system.

The unit record system uses, as do most library circulation systems, a data collection device. The data collector typically has a place where you can insert a punched card and a punched identification badge. Information on the book is entered from the punched card and information on the patron is taken from the punched badge. In addition, there are a number of keys on the data collector which can be used to enter variable data such as the date due.

In a unit record system there are two common sub-types: the one-card system and the two-card system. In the one-card system there is a punched card in a book pocket in the back of each book which contains the identification number for the book. When the book is checked out this card is inserted in the data collector along with the patron identification badge. The date due is entered on the keyboard and release key is hit. The data collection device then punches a card which contains book information, patron information and the date due. The book card is replaced in the book and the identification badge is returned to the patron. The transaction cards are batched at the end of the day and merged with the accumulative transaction file which is then used to produce a listing of books in circulation. When discharging the book, the book card is removed from the book and placed in the data collector and the date discharged is entered on the keyboard. This discharge transaction is then used to sort out on unit record equipment the circulation transaction record. These cards can then be used to produce a listing of books discharged that day.

In the two-card system, you perform the same activities, however, the data collection device will produce two transaction cards. One card will go with the book along with the book pocket card, the other card will be used in the circulation file. When discharging a book under the two-card system, you need only pull the card that was punched for the original transaction and the book is ready to be shelved at that time. These cards are then used to pull the circulation record from the circulation file. In the two-card system the data collection device is not needed at the point of discharge.

In the batch-mode off-line system both the one-card and the two-card systems are used. The basic difference is the use of a computer instead of unit record equipment for the processing.

"Batch-mode" means that transactions are accumulated during the day and then processed by the computer all at one time. "Off-line" refers to the status of the computer at the time the transaction takes place. Where transactions are batched and processed at later times the computer is obviously off-line. In on-line systems the computer actually processes the transaction the instant that it takes place.

It appears that the batch mode off-line circulation system is the most prevalent in use today. Arkansas State University and Florida Atlantic University are both operating on a batch-mode off-line circulation system. The sample system that I will discuss later came from Wright State University, Dayton, Ohio.

The on-line data collection system is very similar to the off-line system. In this type of system the data collector is connected on-line to the computer as the transaction takes place, the information is transmitted directly to the computer and is logged on a transaction tape. At the end of the day, or at periodic periods during the day, the log tape is processed in a batch-mode. These systems are usually used when the large computer is available where the library system can accumulate transactions in a time-shared environment. In a time-shared system, the computer is only busy when it is actually processing a transaction. The computer time is shared with various other users who may be performing a great variety of tasks.

Sample systems of the on-line data collection type are Northwestern University and Midwestern University in Texas.

The fourth type of system is the on-line catalog access circulation system. Notice that I introduce the term catalog at this point. What distinguishes the on-line catalog access system from the on-line data collection system is the presence of a master file (catalog). With the on-line catalog access system you have on-line inquiry capability which is not present in any of the previous systems discussed. Typical inquiry questions are as follows: Do we have the book? Is the book available? When will the book be returned? In this type of system all transactions affecting the circulation status of a book are processed on-line.

There is only one system that is presently operating in this country--the BELREL system. This is an on-line system which connects three libraries of the Bell Telephone Corporation over long distance telephone lines. Their system is limited in that they can only inquire about books in circulation, and not the entire file. The Ohio State University Circulation System will provide full file inquiry.

A TYPICAL AUTOMATED LIBRARY CIRCULATION SYSTEM

The system that we will talk about is a typical off-line batch mode system. The system uses an identification badge in conjunction with a data collector. To perform a check-out transaction you insert the patron's identification badge and a book pocket card into the data collector, and the data collector will then punch a card recording the transaction (Exhibit 1). The transaction card may be punched by the data collector itself or by a keypunch which is located separately from the data collector. Some systems may use punched paper tape instead of punched cards.

Some data collectors are available now which can write directly to magnetic tape. These charged transactions are accumulated during the day and are sent to the Computer Center where they will be entered into the Circulation System. When the books are returned, the book pocket cards are removed from the book and are inserted into the data collector (Exhibit 2). This creates a discharge transaction which is batched and sent to the Computer Center for processing.

In the match and edit run there are basically two activities (Exhibit 3). First, a check is made on all transactions for valid patron identification numbers. This is done by checking the transaction identification number against a user name and address file. The name and address file contains the borrower's identification number, name, and address. All erroneous ID numbers are printed on the error listing. Secondly, this run checks all transactions and performs basic editing functions. The program will check that fields from the transaction cards are correctly aligned, that codes used are valid, and that all dates are valid. Again, errors detected will appear on the error list. Transactions which appear on the error list will be corrected and reentered during the next batch processing cycle. The output of the match and edit run is a file of valid current transactions.

The current transactions are then sorted in a computer sort by call number. These sorted current transactions are then used in various computer programs which will be discussed, shortly.

The sorted current transactions file is then processed by the update circulation file run (Exhibit 4). This run will process the transactions and add them to the current circulation file, or, in the case of discharges, will remove the record from the circulation file. The output of this run is an updated circulation file and a fine file. The fine file is created by comparing the date discharged with the date due on the circulation file. Fines that were paid at the time of discharge are indicated on the discharge transaction and a record is not sent forward. The fine file is then sorted by patron identification number.

The fine print run will lead the sorted fine file and pull from the name and address file the name and address of those patrons which have fines due. The run will then print a fine notice which contains information on the material borrowed, the date due, the date discharged, and the amount of the fine. The patron's name and address will appear on the fine notice. These notices can be printed on post card stock and taken directly from the printer, separated, and mailed.

The updated circulation file is passed through the print circulation list program which will print the books in circulation report (Exhibit 5). This report is the basic source document for the circulation system and contains the book identification number, author and title information (if available), patron identification number, date due, and various indicators. Indicators can be used to identify items overdue or items with holds.

To process overdue items the circulation file is passed through the extract overdue run (Exhibit 6). The date due for items in the circulation file is compared to today's date and those items which are overdue are passed to the overdue file. The overdue items are then sorted by user identification number.

The sorted overdue records are then passed against a name and address file to print the overdue notices. The overdue notices are printed in a similar fashion to the fine notices and are mailed to the patrons.

The sorted current transactions are input to an analysis run (Exhibit 7). This run will analyze the transactions and print a daily analysis report. There are various types of reports that are possible with the information available on the transaction file. Some samples would be: An analysis of charge transactions by call number class, an analysis of transactions summarized by the hour of the day, an analysis of the books discharged by length of time in circulation, etc. The summary file may be written during this run which would compress the transactions into broader categories and retain them for detailed analysis weekly, monthly, or quarterly.

To process holds in the circulation system the request for hold is keypunched (Exhibit 8). The hold request transaction will contain the patron identification number, the identification number of the book, and the date the hold was placed. The hold transactions are then sorted by call number.

The new hold requests are then added to the hold master file which contains the records of all outstanding holds in the system. This updated hold file is then compared against the daily transaction list and those items discharged which match a hold record are printed out on the holds returned report. From this report notices can be sent to the patron notifying him that the material is available.

Cost Estimate for a Typical System:

1. Conversion (non-recurring)

Prepare book cards for all present books 60 characters per title times 100,000 volumes of six million characters. Conversion at 70¢ per thousand characters	$ 4200.00
Book cards and master book cards:	200.00
Slip cards in books:	1000.00
Glue pockets into books:	800.00
Book pockets, $6.05 per thousand	480.00
TOTAL	$ 6680.00

2. System design and testing (non-recurring)		
Programmer one half time for three months	$	1000.00
Programmer full time for three months		2000.00
Machine time for testing and debugging		300.00
TOTAL	$	3300.00
3. System Maintenance (annual)		
Prepare book cards for 36,000 new volumes per year broken down into the items as follows:		
Punching:	$	1500.00
Cards:		35.00
Forms:		200.00
Machine rental broken down in the following items:		
Annual cost		
Data Collection system:	$	6000.00
Computer at 30 hours per month at $30 per hour:		10,800.00
TOTAL	$	18,525.00

INNOVATION AND TECHNOLOGY

Most automated circulation systems in use today essentially ignore the tremendous advances in computer technology. As you can see from the circulation system that we previously discussed, the systems perform the same activities that are being done in a manual system. When a book is checked out, a record is added to the circulation system; when a book is discharged, a record is deleted from the file, if a book is overdue, a message is sent to the user, etc. What you have is a very sophisticated computer system replicating an archaic manual system.

Libraries should not make the same mistake as the railroad industry. Railroads felt that their business was "trains" - not "transportation". The recent bankruptcy of Penn Central Railroad should point out the fallacy of this reasoning. The real business of libraries is "information" - not "books".

One example of an innovative computer system, is the Ohio College Library Center (OCLC). The OCLC has a membership of 57 colleges and institutions in the state of Ohio. This project is headed by Fred Kilgour, a noted authority in the field of library automation. The OCLC is planning a total library system tied together by a communications network which will encompass acquisitions, cataloging, circulation, serials control, and information retrieval. Although this sounds like pretty blue sky activity, the initial on-line shared cataloging segment is planned for implementation in July, 1971. A cataloger anywhere in the state of Ohio can

sit down at a CRT terminal and request a book by author and title or LC Card Number. If the book has been cataloged by the Library of Congress or by any member in the OCLC system, that cataloging will be displayed on the screen. The cataloger need only make local changes to the cataloging record by using a keyboard. This information will be transported back to the central computer, the changes will be made, and a complete set of catalog cards will be produced and mailed back to the cataloging library. Local holdings information will be added to the master file and eventually the entire catalog for the state of Ohio will be available for inquiry to any member.

The Ohio State University remote catalog access and circulation system provides another example of the innovative use of computer technology. The OSU library system contains 2.4 million volumes, 700,000 separate titles, 26 department libraries, and 60 separate collections. One large Main Library contains approximately 56% of the titles.

To check out a book in this system, the user will pick up a telephone and call a telephone operator stationed in the Main Library. The telephone operator, seated at a CRT terminal, will enter the author and title of the material requested by use of a shortened key. The key is composed of the first four letters of the author's last name and the first five letters of the first significant word of the title. Items matching this key will be displayed on the CRT screen; the operator will translate this information to the user. If the user requests the material, the operator will enter the user's identification number and the book will be charged to the user at that time. The computer will then send a message to the holding library where the book is located which will print on a typewriter terminal. The holding library will then page the book and place it on the hold shelf. We are studying an additional service for the user which would include delivery. With this system we have provided known-item access to the catalog for anyone who can use a telephone.

For local check outs, the call number of the book and the patron identification number are entered on a typewriter terminal and the book is checked out at that time. The system uses an IBM S360/50 with 512,000 byte core memory, a 2314 disk storage unit for the master file, ten 2260 CRT terminals, and thirty-three typewriter terminals.

QUESTIONS AND ANSWERS: Discussion

Did you convert a MARC II record?

No, what we converted was a short record containing only that information needed for circulation purposes. As we add additional segments to the system, we can expand the record size. All records are variable length and contain a record directory. We do have a field which contains the Library of Congress card number which we

may use at a later date to pull a full catalog record from the Library of Congress files when they become available.

Will we have as many problems as you encountered?

Some of the problems at O. S. U. are unique to high volume situations. For example, on our file conversion we had to proofread 63 million characters of information.

What about users who read books in the library?

Any books that leave the stacks without being checked out exist outside the computer system. You will have less problems with the system if you tighten up the control of the book stacks and make sure that all items that leave the stacks are checked out.

How do you get fines off the file?

When the fine is paid you create a transaction which wipes the fine record off the file.

How can you tell if a book has a hold on it at the time of discharge?

The hold master file could be printed daily and kept at the discharge desk. Perhaps, a copy of the circulation file, indicating items in circulation with holds, could be kept at the discharge desk.

In the OCLC system, once a record was cataloged, when does it become available?

Instantly.

What about local changes to the OCLC record?

These changes are kept on a local record and will be part of each institutions file. Local changes can then be displayed upon request.

In the O. S. U. system how are books kept on the hold shelf?

Books are placed on the hold shelf in the user identification number sequence. To pick up the material the user must present his ID card to the check out clerk and thereby, provides a measure of security.

In the O. S. U. system what happens if you get more telephone inquiries than you have telephone operators?

The telephone center has a recorded message which will instruct the user to call back again or call back at a less busy time of the day.

Why didn't you use book pocket cards?

We did a quick study and found that we didn't have enough shelf space to add 2.4 million book pocket cards and book pockets to the collection. This is a good example of our high volume problem. Experience in the BELREL system has shown that there is no appreciable difference in time between keying the information for a charge transaction and entering the same information into a data collector.

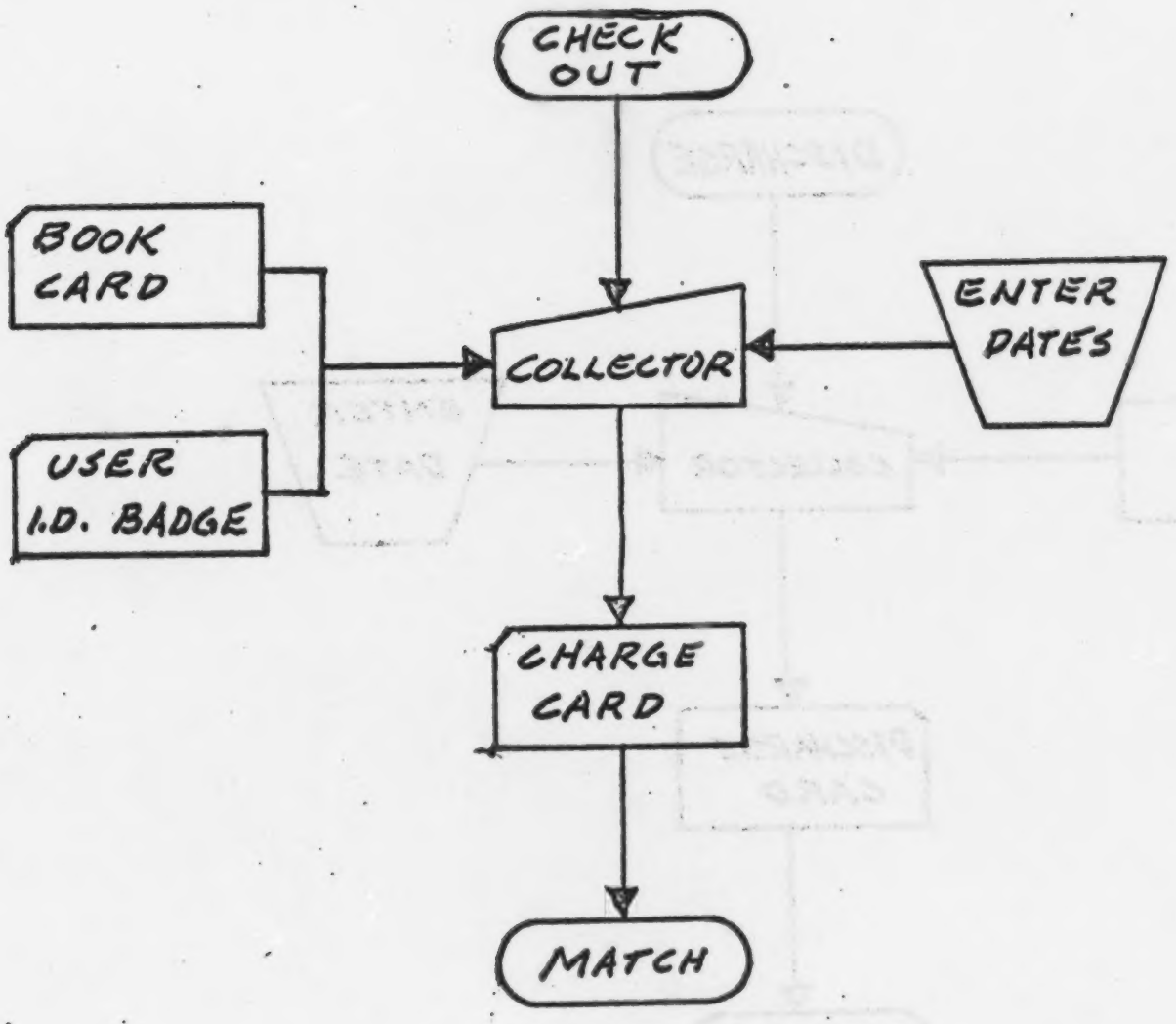

CHECK OUT
BOOK CARD
USER I.D. BADGE
COLLECTOR
ENTER DATES
CHARGE CARD
MATCH

EXHIBIT 2.

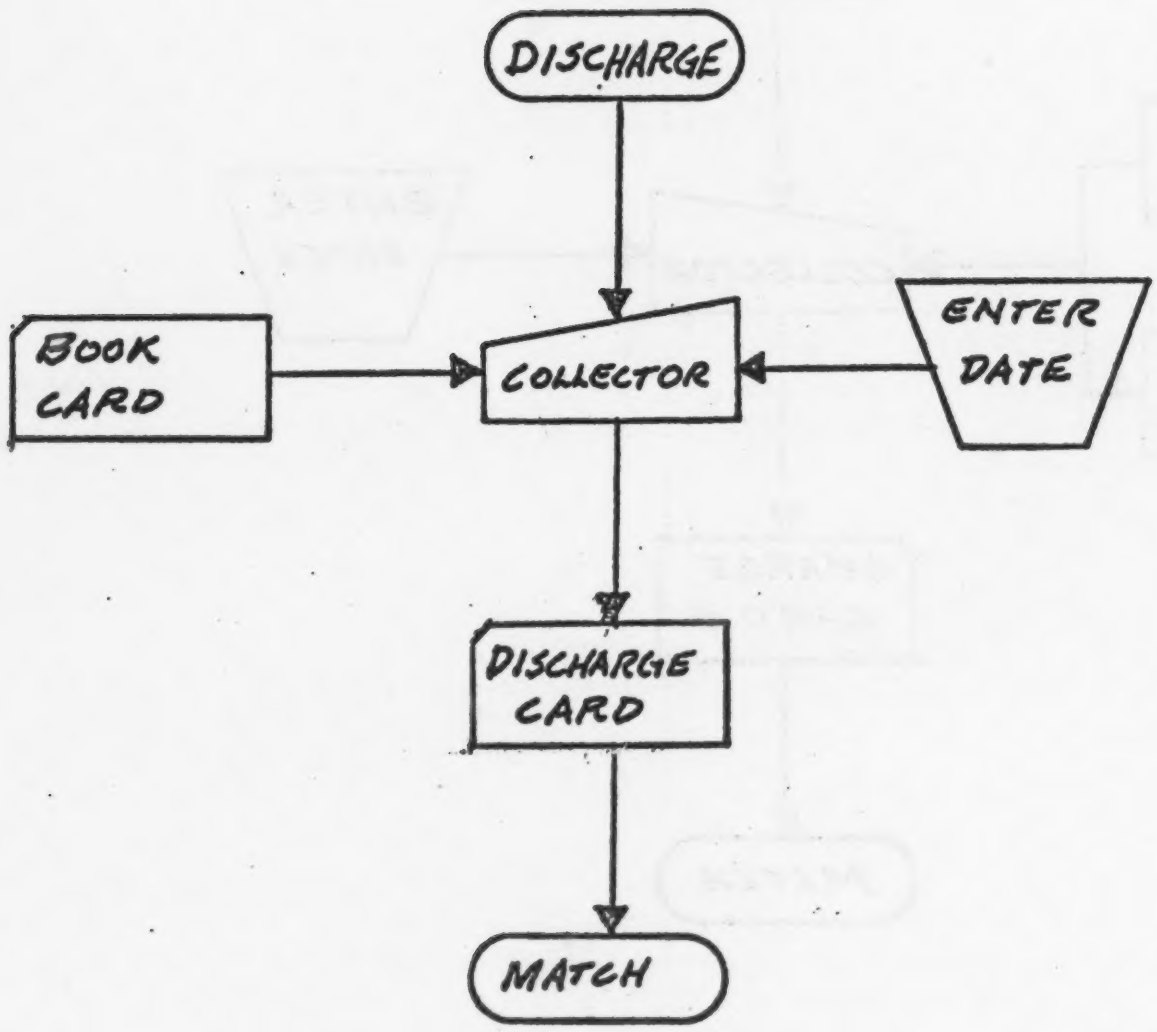

DISCHARGE
BOOK CARD
COLLECTOR
ENTER DATE
DISCHARGE CARD
MATCH

EXHIBIT 3.

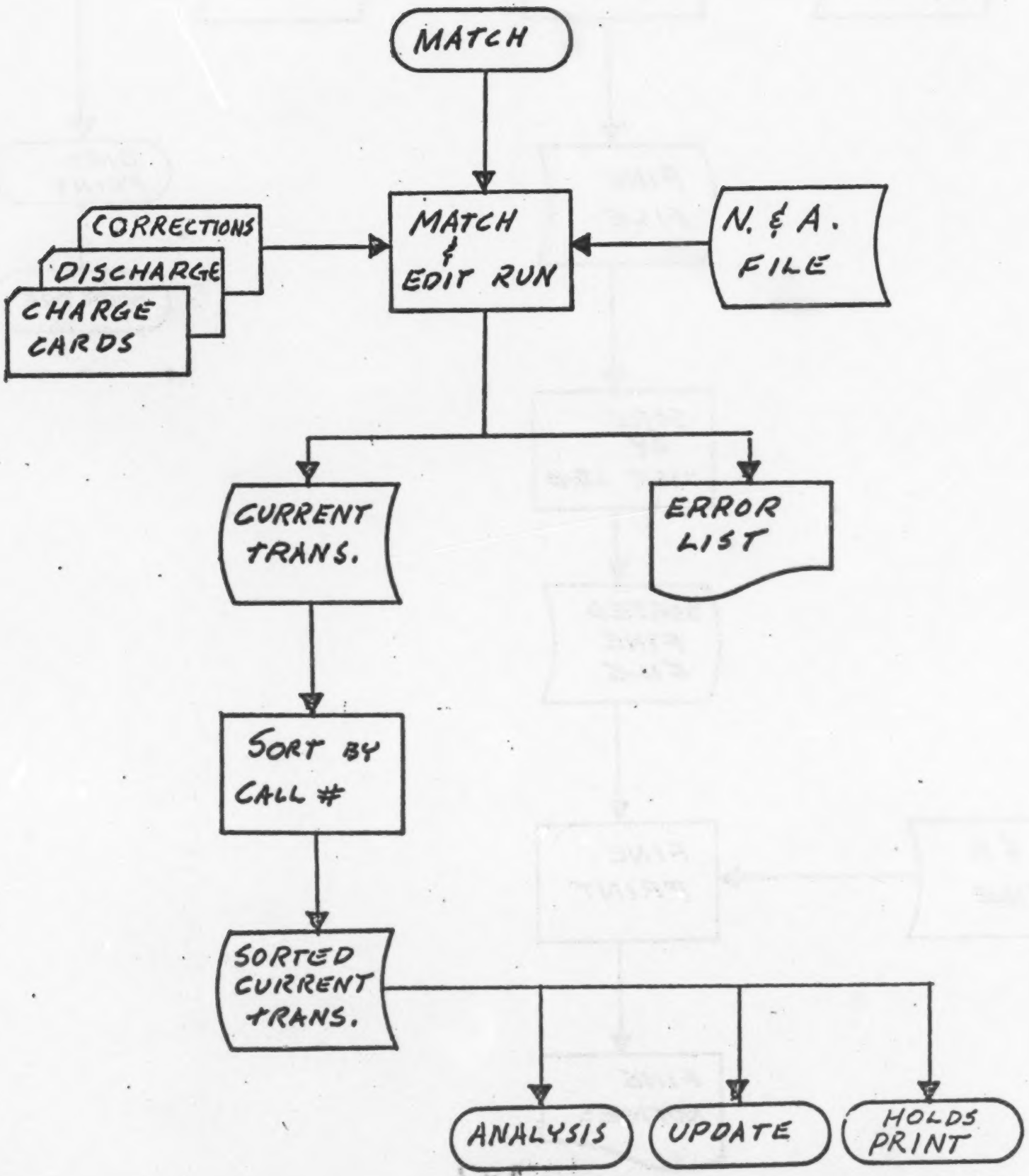

MATCH
CORRECTIONS
DISCHARGE
CHARGE CARDS
MATCH & EDIT RUN
N. & A. FILE
CURRENT TRANS.
ERROR LIST
SORT BY CALL #
SORTED CURRENT TRANS.
ANALYSIS
UPDATE
HOLDS PRINT

EXHIBIT 4.

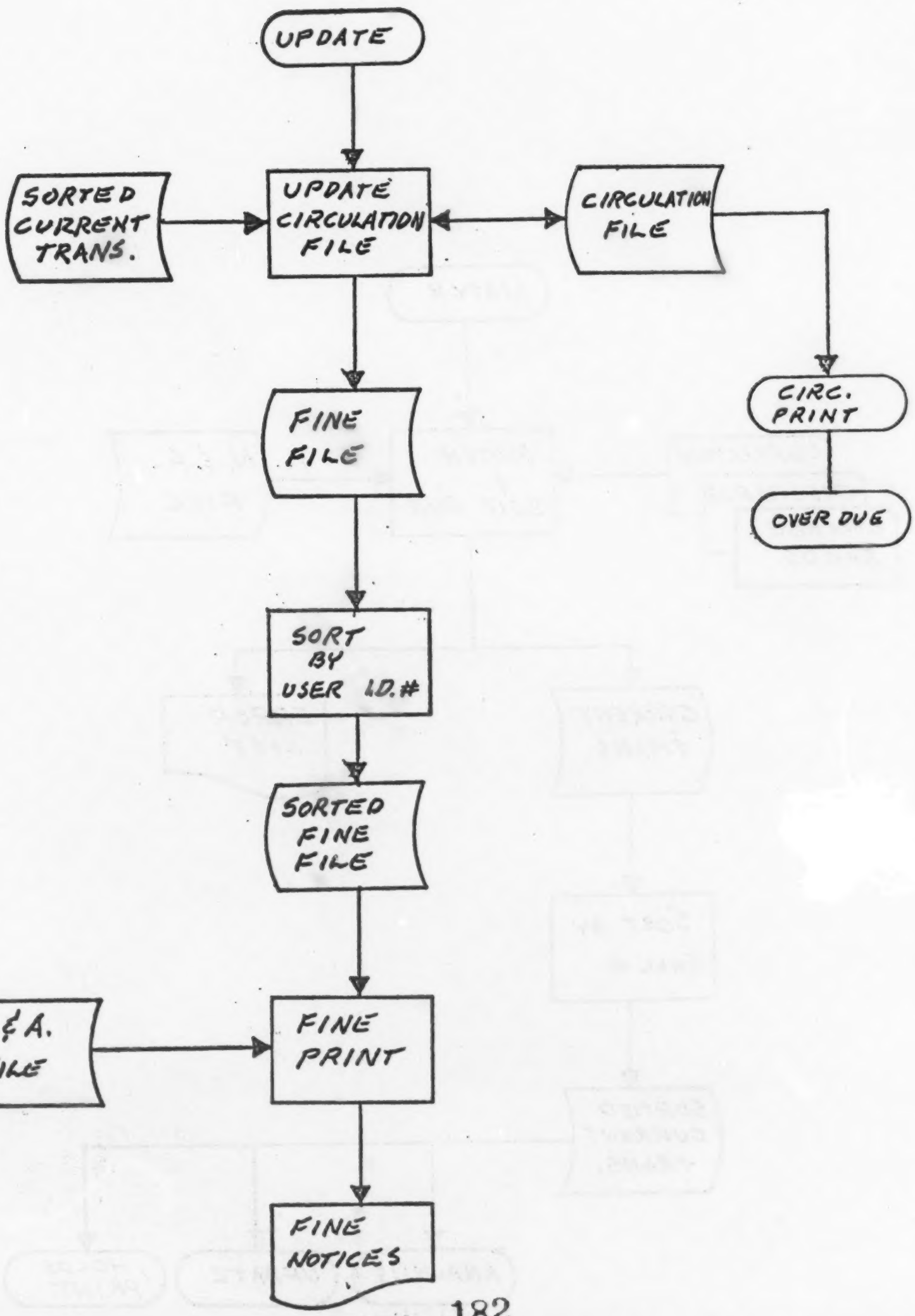

UPDATE
SORTED CURRENT TRANS.
UPDATE CIRCULATION FILE
CIRCULATION FILE
FINE FILE
CIRC. PRINT
OVER DUE
SORT BY USER I.D.#
SORTED FINE FILE
N. & A. FILE
FINE PRINT
FINE NOTICES

EXHIBIT 5.

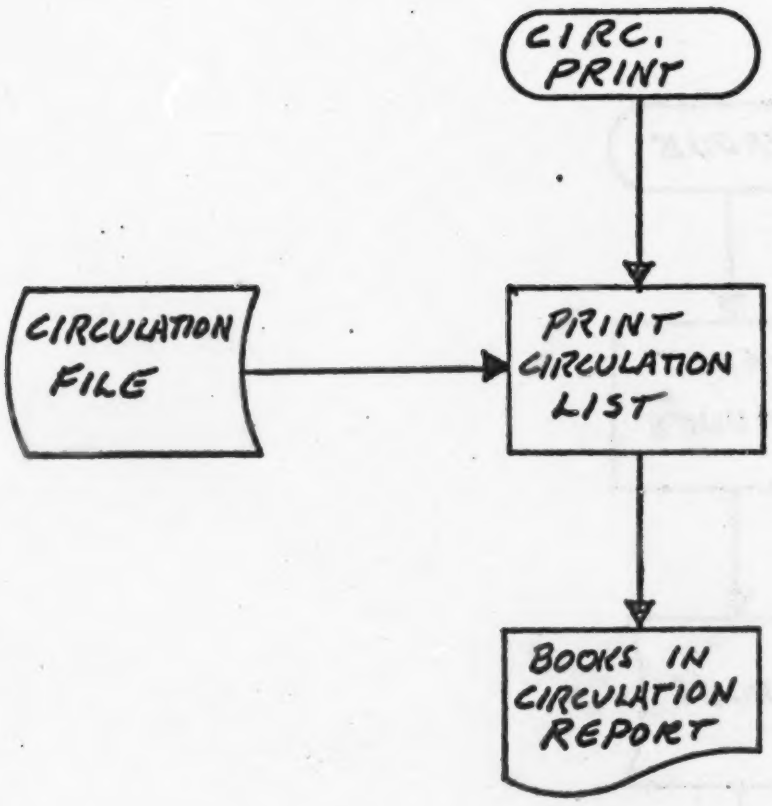

CIRC. PRINT
CIRCULATION FILE
PRINT CIRCULATION LIST
BOOKS IN CIRCULATION REPORT

EXHIBIT 6.

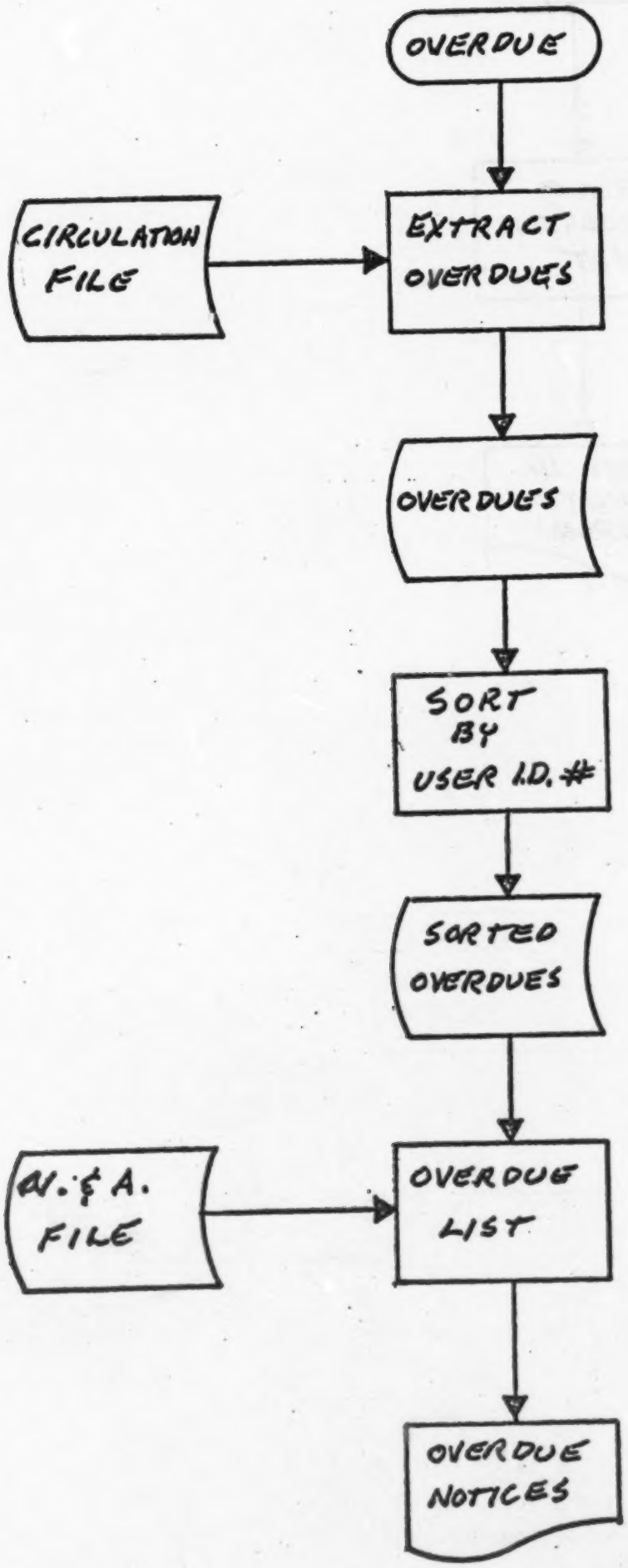

OVERDUE
CIRCULATION FILE
EXTRACT OVERDUES
OVERDUES
SORT BY USER I.D. #
SORTED OVERDUES
N. & A. FILE
OVERDUE LIST
OVERDUE NOTICES

EXHIBIT 7.

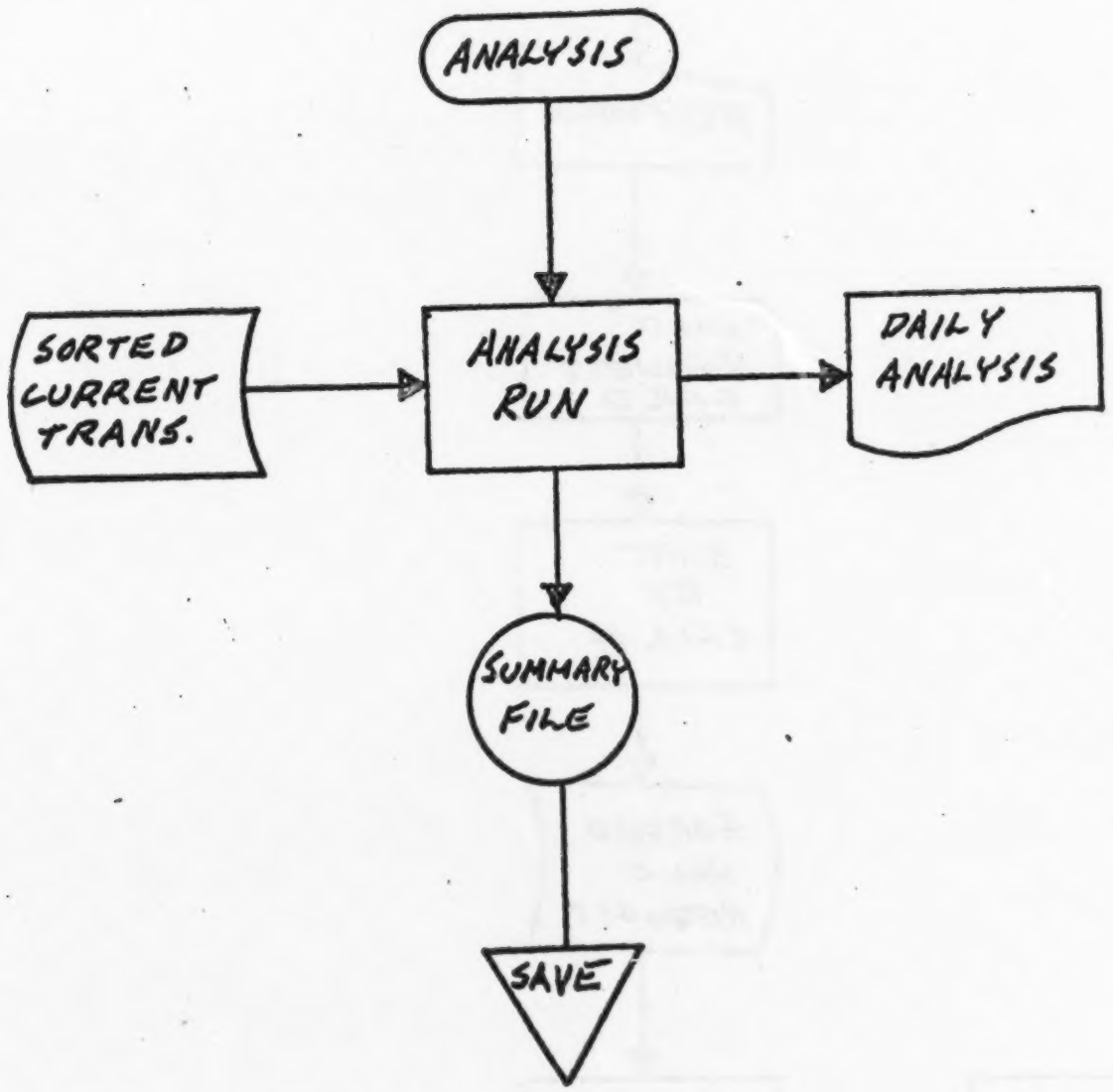
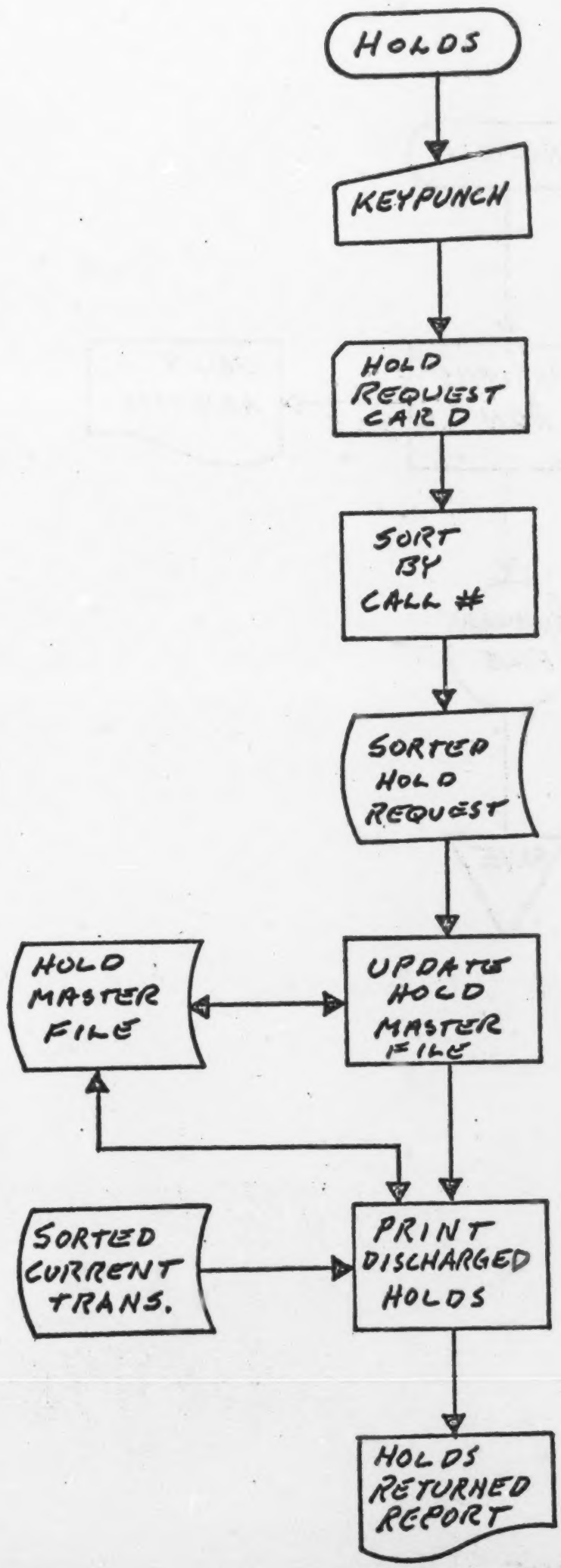

ANALYSIS
SORTED CURRENT TRANS.
ANALYSIS RUN
DAILY ANALYSIS
SUMMARY FILE
SAVE

EXHIBIT 8.


HOLDS
KEYPUNCH
HOLD REQUEST CARD
SORT BY CALL #
SORTED HOLD REQUEST
HOLD MASTER FILE
UPDATE HOLD MASTER FILE
SORTED CURRENT TRANS.
PRINT DISCHARGED HOLDS
HOLDS RETURNED REPORT

WSU LIBRARY 02-15-70
WICHITA, KANSAS 67208
THE FOLLOWING ITEM WILL BE HELD AT THE
CIRCULATION DESK FOR FIVE DAYS FROM
THE ABOVE DATE

CALL NO.
L133M45GC288

289449376

AMBLER M E

AUTHOR.
BROWN WILLIAM

1415 LANE AVE

TITLE.
THE LOVE OF LIFE

CCLUMBUS, GA.

H O L D

SAMPLE HOLD NOTICE
PREPARED BY STUDENT
DURING LIBRARY AUTOMATION
INSTITUTE WORK SESSION

WILLIAMS LIBRARY
BELMONT COLLEGE
NASHVILLE, TENNESSEE

PLEASE RETURN OVERDUE LIBRARY ITEM

CALL-NO: L133M45G0041
AUTHOR: CONFERENCE OF M
CALL-NO: L133M45G0041
HOLDINGS:
DATE DUE: 011970

FINES ARE COMPUTED FROM DATE DUE
REGULAR CIRCULATION 10 CENTS PER DAY
OVER-NIGHT CIRCULATION 50 CENTS PER DAY

Sample Overdue Notice
Prepared by student
During Library Automation
Institute Work Session

ELEVENTH DAY, June 25

AUTOMATING SERIALS

By

SAM A. DYSON

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AUTOMATING SERIALS

SAM A. DYSON

This morning we are going to consider serials automation. I don't know how the other members of the faculty feel, but I feel like serials lend themselves least to automation, primarily because there are so many variables. I would like to give you a brief background first of all of Louisiana Tech's experience in automation techniques, and, of course, the primary presentation will be on our serials project.

I think fundamental to the background of our consideration has been the planning in the last 2 1/2 years of the new addition to the library. You have been told something about it since you have been here. We will have a nine-story addition to our present structure, which means that in cataloging and materials organization we were faced with the terrible prospect of having multiple card catalogs. So we began to think in terms of computer output, book catalogs, and computer lists, rather than a separate card catalog on each floor. With that kind of horror facing us, we began to cast around and look for possibilities of using computers to help us with our problems.

We had already been given assurance by the computer center and by our computer advisory board on the campus that library procedures would receive high priority. I had done my homework and told them that if we ever went to a computer and were depending upon it, we had to have the time, whether it was two o'clock in the morning or twelve noon; otherwise, we could not go into any of these automated programs.

We have several programs in progress, but we have none that are operating. We began very timidly. Several years ago, we tried to eliminate a bottleneck in overdue notices at the end of the quarter. On an experimental basis, we keypunched all the student campus addresses in machine readable cards and used that file for sending overdue notices. It was very successful. We discontinued that then, in order to do some planning on the new building so that this program would be possible when the thing was built.

We now have a shelf list project going. Our shelf list has been selectively coded, and computing center personnel are presently punching cards. I have thirty-five boxes of computer cards in my office as back up in case somebody blows my tapes. I'm going to keep those cards until they finish the punching project. And then we'll use tape back-up instead of card back-up. That project is about two-thirds finished as far as keypunching is concerned.

You might be interested to know how we coded that. We had fourteen of our full-time personnel agree to spend the first hour they were on duty in the morning coding code sheets using the shelf list as a source document. Of course, I had already outlined to them the format of a card and the format of a coding sheet. We got fourteen man hours of coding done every day, and no one really suffered for it. They all learned a great deal about accuracy, and about writing legibly. There still remains a chore that nobody enjoys -- correcting the mistakes. I've pretty well taken this job upon myself at this point, but I may get some help later on. That is going to be a real formidable task, but I have two years to do it.

We are also currently cooperating with twelve other institutions in the state in a Library of Congress card number Union List project. Each participating library submits to the University of Southwestern Louisiana their LC card numbers from the books they have recently acquired. We are punching the card number and our library code into cards and sending them to U. S. L. Others are just sending process slips containing the card numbers after their catalog departments finish with them. We are cooperating in this for several reasons:

Because of a previous federally funded project of the State Library, our State Library resources have been surveyed by the Humphrey brothers of New York. They made certain recommendations concerning systems of libraries in the state. As we studied their recommendations, we realized that in order to be most efficient, we were going to have to find out what everybody else in the state had. The academic librarians, having felt this need many times before, and having a new librarian in the state (Bill McGrath, USL, who fathered this brain-child), began to search for an economical way to have a union list of materials held in the academic libraries. We are using LC card numbers to produce that list. We also wanted to ascertain whether or not there was much duplication or multiplication of titles among our various libraries in the state. The project has now been going since last January, I believe. We have been contributing monthly (others have been contributing weekly) to this store of LC card numbers. Bill McGrath and his people down at USL have written programs to analyze these things statistically and the figures thus far are showing that there is less than 10% duplication in all our libraries, which came as quite a shock. We thought that when LSU-Shreveport began they would be duplicating everybody's collection. Thus far, this has not been the case. This project has several limitations: (1) It does not include our retrospective collection--only current acquisitions. (2) It is also limited to LC printed cards, so all the material we do from "scratch" is not in the list. That is a vast area that the program does not include. If we ever get to book numbers maybe we can include those, too.

The statistics produced have been extremely interesting. There is very little duplication, and when you have more than three copies of a title in the state, it is a very rare occasion. And these statistics, as I remember, include very close to 30,000 titles. Less than 10% are duplicated titles.

Now the most recent project we undertook is the serials project. I will be quick to admit that we did not do it like I told you the other day we were supposed to do it. We were backed into a crack if you will accept that expression. Right at the time I was finishing and having final approval on the budget for this institute, a faculty member whom I had secured for the serials group phoned me and said there was absolutely no way he could get here. He had been transferred out of the library into the computer center and had a whole line of new duties, and he just couldn't make it. Consequently, I lost my funds for support of that faculty member. I had to have names saying they would be with us to get the money. So, being the director, as many of you know, the "buck" stopped on me.

I had already had Roland Gatlin pour some machine language, SPS and FORTRAN down me, and so I decided that I had better look at a language, COBOL or PL/1, more compatible to bibliographic data. I took some courses here in PL/1 and COBOL from our Colleges of Business and Engineering. I got a little insight into what I was faced with. Then when the faculty, over a conference telephone call and also by virtue of the questionnaires they filled out, indicated that COBOL was the most common language used, we decided upon COBOL for the institute. So I began to really concentrate on COBOL. I went to our serials librarian and told her what was going to happen.

I have done this in very simple steps. I highly recommend this type of process to you for doing any automation in your library. Just take one bite at a time to chew on and when you can handle it, go to the next step. This has been so far a very successful method. Nothing I have done defies the compatibility rule. In other words, everything I have done is in harmony with the total system I envision for Prescott Library.

I really thought we would do circulation first, since everybody else does, but when circumstances dictated, we switched. That is why we went through the drill of coding the shelf list - this was preliminary to our circulation program. But we are continuing that coding and keypunching job. We have gone off on that serials tangent, and we hope that it will fit together somewhere along the way.

From what we call our master holdings file, again which was recently renovated pursuant to yet another project we are working on, which may or may not have computer applications, we selected at random ten titles from each of nineteen letters of the alphabet. We keypunched all the information we wanted on our serials holdings file and built a data base for the testing and debugging of our programs.

In order that you may have a clear picture, and I have told some of our serials group this, our first step after flowcharting the procedure was actually to sit down at the master files in the library and code coding sheets

in a predetermined format. After we coded the coding sheets, we punched cards, based upon our coding, on the 029 keypunch. That gave us a machine readable data base, and that data base has been used to build a holdings file. Now with this serials holdings file, as we call it, constructed, we have proceeded and built several different kinds of programs. We will go into those in just a few minutes.

I have in this sort of homemade volume a print-out of all our serials programs to date. I will go through each of these and tell you what each one does and then if you have any questions, don't be bashful. If I can't answer them, I will just say, "I don't know!".

Our first program is what we called SERIALSA because it was the beginning program. This was our first effort toward automating the library serials records. This is the program that builds the holdings file from cards and puts it out on tape. Its purpose was to build a master file with test data, and, of course, it will eventually become the master holdings file. Right now, all it contains is test data - 192 titles which were input in sets of seven cards and the output is 192 records, each 452 characters long. So I had the problem of reading seven separate cards which would contain the data for one single record. This wasn't such a bad problem, but it caused quite a bit of writing. I think the program had 153 punched card statements. Now with our holdings file on the tape record, we have the following fields:

(1) We have a sequence number. This is to facilitate alphabetic arrangement by title. Instead of trying to alphabetize a 124 character field, I simply put that six-digit number in order and my titles are automatically in alphabetic order. It is a lot better than trying to put a field of 124 characters in alphabetic order. So the first thing in that record is a sequence number.

(2) The second thing is the first part of a title field which is 62 digits.

(3) Then there is a Dewey classification number.

(4) Next there is the second part of the title which is 62 digits.

(5) There is an author number which, for the sake of library science, we call the second line of the call number. It really is not an author number with serials. The machine doesn't know that so I don't tell it any different.

(6) Following that I have a 124 character holdings field. Obviously, I can't get all our detailed holdings statements in 124 characters. It just can't be done. So, in this list I have abbreviated to some extent a holdings statement. In other words, if we have Volume 1 through 10, 1942 to 1952 complete, I put there "Volume 1-10, 1942 to 1952 complete". If volume 11-13 are incomplete, I put the statement "Volume 11-13, 1953 to 1955, Incomplete". In 1954 if our holdings are complete to the present time, I wrote "Volume 14, 1954 to date". In some respects this will not indicate which individual issues are missing, like our serials record does in the serials department. Maybe someday I might expand this record to take all this. At this time I don't feel a need to handle it that detailed.

(7) Then I have each journal coded with up to four subjects. The first subject is determined by the College which pays for it. The first question they ask is, "How many journals do we take in our College?" Then we can give them a list. The second subject is what I call the "primary" subject of the journal which may harmonize with the College that is taking it. Now in all institutions, journals have more than one area of interest. For example, in Arts and Sciences, we have a lot of journals which are useful to engineering students. These are journals that would be interesting to engineering students or teachers. So that second field is set aside for what I would call the primary subject of the journal. The third and fourth subjects are of secondary and tertiary interest. This is especially important in the journals in the College of Business. They are interested in many things and some of the journals they like are over in the Humanities. So, in those two subject fields, I try to isolate possible areas of interest. So again we are limited to four subject areas. We are using words to describe subjects of journals. You could use codes and convert them to words, but we are using words in the records.

(8) Now the next fields are floor location. You have a high-rise complex here and I anticipated some of our moves. I've actually got 5th floor, 7th floor, and 9th floor written in the records. We can't use that now, but we will by the time this is implemented.

(9) Then I have a source of acquisition, that is, where we get the journal. That is coded with four digits. I indicate in that code whether the journal is domestic or foreign, direct or jobber, and two digits for the initials of the jobber, dealer or publisher. So that is coded. In one of the programs I convert those codes to names and addresses.

(10) Then I have subscription status; whether it's ceased, dropped, or current. If it is "ceased", the magazine has ceased to exist. If it's dropped, we once took it but no longer take it. Once we've started taking a journal--(barring a financial crisis in Baton Rouge)--we won't stop taking it. If it's current, that means we still take it.

(11) The primary language of the journal is indicated next. This isn't too important to us right now, but with the advent of all these Ph. D. programs we will need this code later. We do have 100 or so foreign language journals now. The primary language of the journal is noted.

(12) The physical form of the journal is coded next, whether it is in Braille or microprint. It is a simple thing to write a program to convert these codes to the full written out word, like "braille", "microcard", etc.

(13) Then we have noted frequency received: monthly, daily, annually, irregular, etc. This is a good spot to mention the fact that what we're trying to do here is to take care of the majority of the cases. We're not trying to write programs that will take care of every little exception. If you want to kill yourself, you can try that. We're trying to take care of 85 per cent of our serials acquisitions. We feel if we can reach that point of automation, we have done pretty well. There is still going to be 15 per cent of the titles which will remain as manual programs, and there is no way around it.

(14) Then I have an expiration date written in here, and I think you can understand why we do that. We can take soon-to-expire titles and have them renewed before they run out.

(15) The fund that pays for the journal is divided by college, sometimes even by school within the college.

(16) And the subscription cost.

There are other things that we will add to the record later. We will add a binding schedule--so we'll know when to collect the material for binding. Our binding program is running very well right now. We have a monthly schedule (when we have money), and we send them out regularly. Every month we send a group of periodicals to be bound, and every two weeks we send books that are worn out to be bound. So that is the holdings record that we have built on a tape file.

Question: Have you considered converting all your journals to a common expiration date?

Answer: We have considered it, begged for it, and plead for it, and thus far have been unsuccessful. However, we have quite a number of our titles now expiring on December 30.

Question: Is this because of state regulations?

Answer: No, it is because we can't get much cooperation out of the jobber. We use Moore-Cottrell, and Stechert-Hafner. But we are gradually getting them on a uniform expiration schedule.

Our second program was called SERIALSB. There were two reasons for building this program:

(1) Outside of a tape dump, I could not ascertain whether or not we got our information off cards and on to tape. I have a deep rooted faith, but not that deep rooted, and so I wrote another program that would read the tape and print it on the printer. Very simple.

(2) But, there is a reason for doing that on a regular schedule. You want to put out a printed list of your journals, alphabetically by title. We are going to put one of these bound volumes on each floor of the new building. One listed alphabetically by title, one listed by location, and one listed by subject. Each floor will have a separate listing of everything that is in the holdings file. The second program was built primarily to print out what we had on the holdings tape and print it out in a logical order. There are 100 places between each sequence number where we can put new titles in alphabetical order.

Here is an example of how the list is read. The title is Nation, Vol. 14, 1872, incomplete, Vol. 16, 1873 to present. It's bought with general periodical funds; it's primarily political science. It will be located on the first floor; it is a domestic publication; it's bought from a jobber, Moore-Cottrell; it is current; it is English; paper form, weekly; it expires on January 1, 1971. General budget pays for it, $20.00.

Now, the student is not going to need all that information. So we may, at a later date, pick out the portion of the record necessary to the patron if our volume gets too big. For example, we will just print out the sequence number, title, and the holdings, and maybe the subject headings, and leave all the rest of it off. For the time being we take about 1,970 titles, and it didn't present too big a problem.

Question: Did you consider the Union List of Serials as title authority for listings?

Answer: No. Since the student is going to use this list, we took our titles directly from our visible file. We have a visible file on each floor now, and the students use them all the time. On second thought, our serials librarian in building the visible file from which we took this probably used the Union List as her title authority.

The next program that we did was one that I think is going to be one of the first ones needed, and that was a program to sort these in subject arrangement. So again, using the same holdings file tape, (it is in the computing center labeled "DYSON1"), we pull selected information from it, sort it, and print it out in alphabetical order by subject. The information we take off that master tape is subject, sequence number, location, and full call number. It is read from the tape, put on a disc, sorted, run off on to another tape, and printed from that second tape. The output looks like this: first, the subject, title of magazine, sequence number, location, call number. So you don't have to use all your information on your record. (452 characters). You can just pull off 133 of those characters and print what you need.

The next program in sequence that we did was to sort by location. I wanted a list on each floor which contains all the journals housed on that floor, plus the journals housed on other floors. Again, we selected information off the holdings file tape. I really didn't think about this until the print-out came, but I wasn't through anyway, so I didn't worry about it; the floor location is in alphabetic order, so it doesn't necessarily mean you are going to read from the first floor to the ninth in sequence. You're going to read alphabetically as the floor numbers are spelled out. What I'm going to do is write a few more statements in there, and every time we get to a different floor, I'm going to skip to the top of the next page. We'll have a separate volume for each floor.

Anytime you're considering a file like this, there is always the problem of how you get new information. Serials are notorious for changing titles. They change prices, format, everything. In serials more than anything else, you are going to have to have an update program. In my original file, I left out a lot of information. Also, I left out three author numbers. So, I have written a program that will insert any one of the items in that list. There are nineteen fields in this record, and it will pick out any one of those fields and

put new information in it. I went back and checked the spots where I had put in the information and it put it exactly where I wanted it. Of course, this was a thrill to me, not being an old time programmer.

There is one nice thing about these tape dumps here, on our configuration, it counts the record for you and tells you what the length of it is. If one is too long or too short, it sticks out like a sore thumb.

In conjunction with the receipt of periodicals, we were thinking about producing anticipated receipt cards. We'll say weekly, using our master file, keying off of frequency, we will produce cards which represent journals that need to come in this next week. Everytime a journal comes in, the card for it will be put inside the journal. We'll be able to use those cards later on in another program in an SDI context; that is, to disseminate information to interested faculty, according to a faculty profile sheet. But, for the time being, we're using them strictly for anticipated receipt cards and for claim letters. Every card that is left over at the end of the week represents a magazine issue that has not arrived. We take those same cards and they become part of a basic record to produce a claim letter to the jobber, dealer, or publisher and tell them we didn't receive that issue. In order to do this business of sending claim letters to jobbers, we had to build and keypunch a program which holds the addresses of jobbers and publishers with which we do business. Everyone of the codes we have put in (last two digits on our acquisition source field) had to be filed in a list that contains the full name and address of the firm. So, this is what we did.

We built in this program an address file of vendors that we use in our serials department. It has the added feature, which is necessary when you are building sequential files, that if you run into a code that is not covered in your address file, you'll have to do something with it or your program will blow. So, it has the feature of display. If you run into a code that is not included in your code list, it will print out the code and the sequence number of the title, so that you can pinpoint exactly which journal caused the malfunction. It gives the machine something to do besides blow up in your face. This came off the console typewriter--DDGI, which means domestic, direct, gift. Of course, in my address file, there was no record of DDGI, so it says, "no record found", and went on to the next card. Then there was FJSH--foreign, jobber, Stechert-Hafner--somehow I left that out of the address file, too.

The address letters themselves can be output in many, many ways. There are as many different ways as there are people in this room, I guess. You can have a pre-printed message on a postcard, and you can put in just the name and address and the issue that you are claiming. You can put these on data mailers, which are expensive. For the sake of our experiment, I wrote the whole message on the output sheet

Prescott Library
Louisiana Tech University
Ruston, Louisiana 71270

I didn't put the date--no problem. "The latest issue of the following title has not at this writing been received by this library. Please check your records and send us a copy by return mail." That message could be anything.

Title is VIROLOGY, expected receipt date, June 1, 1970. You probably would give it about a month to come in late. Then the agency is addressed. This will fit on an IBM card, or you can make it fit on a postcard, 8 1/2" x 11" paper, etc. If we were to adopt some form like that, we would probably have a pre-printed message.

This is the point at which I quit. I think the most important part of this presentation is that you can, hopefully, see how we went one simple step at a time. We have actually done nothing more than build and manipulate information from a single, data tape. All this is manipulated information off a single tape. Everything we've done so far is compatible with the systems we have dreamed of for the future in our library.

Are there any questions?

Alright, you have in your packets this monster (68 pages of stuff). This goes into more detail about what I have just told you. I have not proofed it. Also, you'll find in there the actual programs. Don't try to keypunch these without some debugging. Every program I've written for serials is in here.

Answer: Time wise I would imagine it is faster to do it by anticipated receipt cards. Because you've got on your visible file at the present, and you're not going to enter anything on the present file until something isn't there. So, it will be nothing more than taking this anticipated receipt card file alphabetically and pulling the title and sticking it in the magazine and sending it on. I can't give you any cost figures on this at this time because it is run only on an experimental basis. We have presently a binding schedule for journals. What we're going to do is code that schedule in this master record. We have plenty of extra space in our holdings file for coding in a binding schedule. We do this monthly, so it will probably take the form of a two-digit numeric number in the form of 01 for January, 02 for February, etc. We'll ask the computing center to print out a list of titles to be bound in January.

No, I say it is going to do away with that readex file. The only time you make an entry is when the magazine does not come, and that won't be until after you have given up. That card keeps showing up in the anticipated receipt cards. Give yourself room for expanding the files.

Let's take a coffee break.

TWELFTH DAY, June 26

(Note: Activities not available for publication)

THIRTEENTH DAY, June 27

(Note: Critique not available for publication)

APPENDICES

APPENDIX A
LIST OF PARTICIPANTS

257-4269 ALBERTI, DINO A.
LA POLYTECHNIC INST
P. O. BOX 607
JONESBORO, LOUISIANA 71251

257-2697 ALPER, BRUCE H.
FLORIDA ATLANTIC UNIVERSITY
100 ROYAL PALM WAY
BOCA RATON, FLORIDA 33432

257-4866 AMBLER, MARY ELIZABETH
THE LINDENWOOD COLLEGES
929 ROBERT PLACE
KIRKWOOD, MISSOURI 63122

257-3872 ARCHER, DAVID
CLEVELAND STATE COMM COLL
1100 20 ST NW
CLEVELAND TENNESSEE 37311

257-4061 BROWN, HUGH A.
BELMONT COLLEGE
BELMONT COLLEGE
NASHVILLE, TENNESSEE 37203

257-3586 CARRAWAY, EDWARD E.
WICHITA STATE UNIVERSITY
1547 N. YALE BLVD.,
WICHITA, KANS. 67208

257- CARTER, JOHN M.
MISSISSIPPI STATE UNIVERSITY
P.O. BOX 5346
STATE COLLEGE, MISS. 39762

257-3468 DRAKE, MAYO
LSU MED SCH IN SHREVEPORT
3756 RICHMOND AVENUE
SHREVEPORT, LOUISIANA 71104

257-4334 DYSON, SAM A.
LOUISIANA TECH UNIVERSITY
2 WESTWOOD HILLS
RUSTON, LOUISIANA 71270

257-3183 FERRARA, MARK M
NEWARK STATE COLLEGE
25 MANOR DRIVE
NEWARK, NEW JERSEY 07106

257-2481 GATLIN, ROLAND D.
MISS. STATE UNIVERSITY
P. O. BOX 863
STATE COLLEGE, MISS. 39759

257-4592 GIBSON, DENNIS A
UNIVERSITY OF SOUTHWESTERN LA
P O BOX
PERRY LA 70575

257-4787 GRAHAM, SANDRA D.
FT. LEWIS COLLEGE
840 PLYMOUTH DR. BOX 202
DURANGO,COLORADO 81301

257-4214 GREAVES, LANDON
SOUTHEASTERN LA. COLLEGE
P.O. 302 COLLEGE STATION
HAMMOND LOUISIANA 70401

257-3545 GUTHRIE, GERRY D.
OHIO STATE UNIVERSITY
RESC. CTR. 1314 KINNEAR RD.
COLUMBUS, OHIO 43212

257-2778 KENNEDY, JOHN P.
GEORGIA TECH
1308 VALLEY VIEW RD.
DUNWOODY, GEORGIA 30338

257-4194 MC DONALD, BAXTER JR.
NORTHEAST LA. STATE COLLEGE
2207 GALE ST
MONROE, LA. 71201

257- MINITER,JOHN J.
TEXAS WOMAN,S UNIVERSITY
13511 HEARTSIDE PLACE
DALLAS, TEXAS 75234

257-3974 POUNCY, MITCHELL L.
SOUTHERN UNIVERSITY
BOX 10031 SOUTHERN BRANCH
BATON ROUGE, LOUISIANA 70813

257-4034 TAYLOR, GERRY M
ARKANSAS STATE UNIVERSITY
BOX 1017
STATE UNIVERSITY, ARK 72467

257-4034 TAYLOR, MYRA
ARKANSAS STATE UNIVERSITY
BOX 1C17
STATE UNIVERSITY, ARK 72467

257-4123 TRIBBLE, EDWARD J.
UNIV OF THE SOUTH
RT 1 BOX 57
SEWANEE TENNESSEE 37375

257-4787 WHITE, ANNA H.
CENTENARY COLLEGE OF LA.
231 CARROLLTON AVE.
SHREVEPORT, LOUISIANA 71105

257-3084 WICKER, WILLIAM H.
MEMPHIS STATE UNIVERSITY
924 MOSBY ROAD
MEMPHIS, TENNESSEE 38116

257-4214 YATES, DUDLEY
STETSON UNIVERSITY
ROUTE 2 BOX 667 D
DELAND FLORIDA 32720

APPENDIX B

CLASS SCHEDULE

Sunday, June 14, 1970

8:00 - 12:00	Arrival and assignment of living quarters (Kidd Hall)
1:00 - 5:00	
6:00 p.m.	Evening meal; get acquainted

Monday, June 15 (Note: All class meetings will be held in Rm. 302 Keeny unless otherwise informed)

9:00 - 12:00	Mr. A. G. McKee Theory, terminology and tour of Computing Center with hardware description and capability
12:00 - 1:00	Lunch
1:00 - 5:00	Mr. S. A. Dyson System analysis and preparation of flow charts

Tuesday, June 16

8:00 - 12:00	Mr. Roland Gatlin Programming Language
12:00 - 1:00	Lunch
1:00 - 5:00	Programming Language continued

Wednesday, June 17

8:00 - 12:00	Mr. Gatlin Programming Language continued
12:00 - 1:00	Lunch
1:00 - 5:00	Programming Language continued

Thursday, June 18

8:00 - 12:00	Mr. Gatlin Programming Language continued
12:00 - 1:00	Lunch
1:00 - 5:00	Programming Language

Friday, June 19

8:00 - 12:00	Faculty, Group Problems (Rm 301 Keeny Hall) Cataloging Problem: Mr. John Kennedy (#20) Circulation Problem: Mr. Gerry Guthrie (Rm 302) Acquisitions Problem: Mr. Bruce Alper (#23) Serials Problem: Mr. Sam Dyson (#24)
12:00 - 1:00	Lunch
1:00 - 5:00	Faculty, Group Problems

Saturday, June 20

8:00 - 12:00	Faculty, Group Problems
12:00 - 1:00	Lunch
1:00 - 'til	Lake D'Arbonne recreation Tech Forestry Camp #2

Sunday, June 21 — Recess

Monday, June 22

8:00 - 12:00	Dr. William Axford Automating Library Budgets
12:00 - 1:00	Lunch
1:00 - 5:00	Mr. Alper Automating Library Acquisitions

Tuesday, June 23

8:00 - 12:00	Mr. Kennedy Automating Library Cataloging
12:00 - 1:00	Lunch
1:00 - 5:00	Faculty, Group Problems

Wednesday, June 24

8:00 - 12:00	Mr. Guthrie Automating Circulation
12:00 - 1:00	Lunch
1:00 - 5:00	Faculty, Group Problems

Thursday, June 25

8:00 - 10:00	Mr. Dyson Automating Serials
10:00 - 12:00	Faculty, Group Problems
12:00 - 1:00	Lunch
1:00 - 5:00	Faculty, Complete Group Problems

Friday, June 26

8:00 - 12:00	Mr. McKee and Computer Industry Representatives
12:00 - 1:00	Lunch
1:00 - 3:00	Mr. Alper and Mr. Kennedy, Computer Output Microfilmers
3:00 - 5:00	Mr. McKee, continued
7:00 - 9:00	Evaluation by participants

Saturday, June 27

8:00 - 12:00	Mr. Dyson Critique of Institute by Faculty
12:00 - 1:00	Lunch
1:00	Departure of participants

APPENDIX C

AGENDA FACULTY SESSIONS

I. Thursday, June 11, 1:00 p.m., Room 302 Keeny Hall

A. Introductions
Travel expense statements submitted here

B. Packets

C. Tour

1. Of Classrooms

2. Of Computing Center - McKee

II. Friday, June 12, 9:00 a.m., Room 302 Keeny Hall

A. Class Schedule

B. Formal Presentations

C. Informal Schedule

Noon Meal

D. Parameters for group problems

III. Saturday, June 13, 10:00 a.m., Tech Forestry Camp #2

A. System Control - McKee

B. Syllabus

C. Proceedings

D. Evaluation Questionnaire

APPENDIX D

LOUISIANA TECH COMPUTING CENTER

March 16, 1970

PROCEDURE FOR PROCESSING PROGRAMS ON THE LA. TECH IBM 360

I. GENERAL CLOSED SHOP PROCEDURE FOR PROCESSING INSTRUCTIONAL AND RESEARCH PROGRAMS.

All coding sheets that are to be keypunched by Computing Center keypunch operators will be processed through the dispatching system. That is, a coding sheet to be keypunched is left at the dispatching window and picked up from the dispatching window in room KH 106.

A program ready for computer run will be presented at the dispatching window in room KH 106. Such a program must be complete with all control cards and data necessary for processing by the 360 computer. Under normal conditions the first card of an input deck will be the JOB card. The JOB card must contain the job name, department number, project number, the user's name, and the computer time required by the program in minutes (see Dispatching Station Physical Description for exact format). This information is stored by the computer and used at the end of the month to prepare the Computing Center Users Accounting System reports. If special instructions are necessary for the processing of a program, such as mounting special tapes, disks, forms, etc., use one of the old Utilization Record cards that are available on the table by the dispatching window to point out these special instructions and place it first in the input deck.

The machine operator will process programs on a first-in first-out basis. One exception to this procedure will be that long execution time (in excess of 30 minutes) programs will generally be processed during the closed shop run at 5:00 p. m.

Programs will be processed during the normal work day by the machine operator during times that he is not busy with administrative runs. All programs that do not get processed during this time will be processed in an "after hours" closed shop run. This closed shop shift will be from 5:00 p. m. to 8:30 p. m. Programs still remaining to be processed at the end of this operator attended shift will be batched into the system and the program decks and associated output distributed at 7:15 a. m. the next morning. Between terms and during vacation periods the "after hours" closed shop run will not be scheduled.

Any person who feels it necessary to be present in the machine room at the time his program is processed (to add or remove data cards, etc. -- not to correct errors in logic, coding, data, etc.) must submit his program to be processed during the "after hours" closed shop run. The shift operator will have the authority to judge the legitimacy of this need. In order to maintain operating efficiency it will be necessary to keep machine room congestion to a minimum. This is to be accomplished by limiting access to the machine room to Computing Center personnel only. Any classes, laboratories, etc. that wish to use the facility as a group with the instructor should make arrangements with the Director of the Computing Center in advance.

Programs that have been processed may be picked up from the dispatching window. If corrections are necessary, they may be made in room KH 105 and the program resubmitted to be processed again using the above procedure. The honor system will be used to maintain the integrity of this Closed Shop procedure. Everyone should use the utmost caution in picking up processed program decks and output sheets to assure that only his materials and not someone elses are removed.

II. GENERAL INFORMATION

All communication, user-center, will be via Room 102, Keeny Hall.

A. Keypunch In

Source programs will be written on coding sheets (available at the bookstore) and left at the dispatching window in KH 106. Only material submitted on these forms will be processed. All other will be rejected. These programs will be keypunched on a first-in first-out basis.

Corrections to previously punched programs will also be written on coding sheets and submitted as though they were separate programs. No cards should be submitted for keypunch correction. The user is responsible for inserting corrected cards into a program or data deck.

All new programs should be coded including the proper control cards. The JOB card must contain, in addition to the program name the following information: (1) User's department and project number (2) User's name (3) Computer time required in minutes.

Input data will be coded on the reverse side of the coding sheets beginning with the back of the last page used for the source program.

The user's name, department number, project number, course number and problem number should be written in the upper left corner of ALL coding sheets used. Write "360" in large numerals at the top of each coding sheet to distinguish these programs from those to be keypunched for IBM 1620. This is important because the keypunch coding is different.

B. Keypunch Out

After programs are keypunched, the decks will be wrapped with the coding sheet, banded, and will be available at the dispatching window in Room 106 KH. Users should check by this room frequently to avoid an accumulation of programs.

After picking up the keypunched decks, the user should compare this deck carefully against the coding sheet to assure himself that there are no keypunch errors before submitting the program to the computer. If keypunch errors are present, he should write the corrected statement on a coding sheet and resubmit it to keypunch.

C. Computer In

When the user is satisfied that the program is free of keypunch errors, he may submit the deck to the computer. The program deck containing the appropriate control cards, source program, and data should be rubber banded and presented at the dispatch window according to instructions contained in the memorandum on the dispatching system. No unbanded programs will be accepted. Coding sheets and old program listings are NOT to be included with the decks.

D. Computer Out

Upon completion of a run, the computer operator will return the program deck with a listing of the program and a listing of the output (if any) and/or any error diagnostics to the dispatching station. Again programs should be picked up promptly to avoid accumulation. Program materials left more than 72 hours will be thrown away.

E. Program Restart

Programs that require more than 4 hours for execution should include an interrupt-restart routine in order that the program can be restarted without significant loss of execution time if it becomes necessary to interrupt its execution. Users needing assistance in including such a routine in their program can readily get this assistance from Computing Center personnel.

SPECIAL POINTS TO REMEMBER

1. DO hand in all programs for closed-shop processing on coding sheets (available at the bookstore).

2. DO identify each coding sheet by writing name, department number, project number, course number, and problem number in the space provided at the top of the sheet used.

3. DO write "360" in large numerals at the top of each coding sheet.

4. DO clip all coding sheets for one program together.

5. DO check all cards for keypunch errors before submitting program to computer.

6. DO use CALL EXIT statement. (FORTRAN users only)

7. DO observe the following coding conventions.

CODING CONVENTIONS: The following standard coding conventions should be followed in lettering program coding sheets for Closed Shop keypunching.

Neatness is of prime importance
All lettering will be in upper case

Ø - letter 0
0 - numeral 0
Z - letter Z
2 - numeral 2
I - letter I
1 - numeral 1
b - blank space

distinguish (from the letters C and L
distinguish G from numeral 6
distinguish H from N
distinguish S from the numeral 5

8. DO NOT resubmit decks for keypunch corrections; submit a coding sheet containing only the statements to be re-keypunched. Write "corrections" at the top of the page.

DISPATCHING STATION PHYSICAL DESCRIPTION

The Tech Computing Center is now using a dispatching procedure designed to effectively control and protect User's programs that are submitted for key-punching and processing on the IBM 360.

The IBM 360 Closed Shop dispatching station is located at room door number 106 Keeny Hall. A window and counter have been installed in this door for the purpose of receiving keypunching jobs and input programs and dispersing program decks and associated output. Inside the door is a cabinet with forty-nine compartments for the storage of computer output by code number and trays for the storage of program decks that have been processed.

TIME SCHEDULE

The dispatching station will be staffed during the following times:

Monday through Friday

7:15 - 7:45 a.m.
8:45 - 9:15 a.m.
10:15 - 10:45 a.m.
11:45 - 1:45 p.m.
2:45 - 8:30 p.m.

Saturday			Sunday		
8:20	-	9:15 a.m.	2:00	-	3:00 p.m.
10:15	-	11:45 a.m. (G.C.R.)	5:00	-	8:00 p.m. (G.C.R.)
2:00	-	3:00 p.m.			
5:00	-	6:00 p.m. (G.C.R.)			

NOTE: Above times are subject to change as dictated by usage.

During the time not covered by the above dispatching schedule a user, at his discretion and risk, may leave an input program in the tray on the table in the hall. These programs will be put into process at the beginning of the next scheduled dispatching time and after they are processed the decks and their associated output will be placed back on the table for pickup by the user.

G.C.R. - Guaranteed computer runs at these times. Other week-end times are listed for dispatching activities and, if volume dictates, computer runs.

PROCEDURE FOR USE

1. Prepare jobs in usual manner with all necessary job control cards.

2. // JOB card must contain the JOB name, the USER'S Department Number, the USER'S Project Number, the USER'S Name, and the total time required by the program in minutes in the following format:

```
// JOB NEW (0501,01010),"A.User",TIME=3
```

   a) The job name may consist of eight characters or less.

   b) The user name may contain any character between the quotation marks except another quote. The length of the user name cannot exceed 20 characters including spaces.

SDS
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c) The mmm in TIME=mmm is the estimated time in minutes the program will run. The time estimate must include compilation time.

It is important that the estimated time in minutes have no leading blanks and that the time estimate be as accurate as possible. A time estimate that is too small will cause the program execution to terminate before completion (when the time estimate is exceeded by 15 seconds the job is terminated) whereas an estimate that is too large will cause the program to receive a lower run priority and lengthen the turn-around time for its execution (longer programs are run after the shorter programs have been processed).

3. Only if special instructions (such as mounting tapes, special disks, output in excess of 1500 lines of print, etc.) are necessary for the processing of a program will it be necessary to fill in the Special Instructions section of the yellow Utilization Record card found on the table by the dispatching window.

4. Present the input program deck to the dispatcher at the window.

5. The dispatcher will give the user a Receipt Card containing a four-digit number and put a // NUMBER card containing the same four-digit number on the front of the user's input program deck.

6. When the user returns to pick up his program deck and computer output he must present his RECEIPT CARD in order to receive his work.

Any suggestions for the improvement of this procedure will be appreciated.

APPENDIX E

E V A L U A T I O N

Please give us the benefit of your honest opinion on the following points. You may enter comments or not as you wish. Check the most appropriate answer.

	Good	Fair	Poor	N.C.
I. ACCOMMODATIONS:				
A. Housing	15	4	0	
Comments:				
B. Meals	19	0	0	
Comments:				
C. Classrooms	14	4	1	
Comments:				
D. Recreation	11	6	1	1
Comments:				
E. Computing Center	18	1	0	
Comments:				
II. FACULTY				
A. Knowledge of Material	19	0	0	
Comments:				
B. Formal Presentations	15	4	0	
Comments:				
C. Group Leadership	18	1	0	
Comments:				
D. General Helpfulness	19	0	0	
Comments:				
E. Informal Presentations	19	0	0	
Comments:				
III. PROGRAM				
A. General Impression	19	0	0	

B. Where should we have spent More time?

C. Where should we have spent Less time?

III. PROGRAM - Continued

D. Strongest part of the institute program:

E. Weakest part of the institute program:

F. Has the institute been worth your time, expense, and effort?

Yes 19 No 0

Comments:

G. As a result of this institute, do you feel more confident about your ability to use electronic computers in your library?

Yes 19 No 0

Comments:

H. Did you complete the programmed learning course prior to your arrival on campus?

Yes 9 No 10

Comments:

I. Was the institute program practical enough?

Yes 17 No 2

Comments:

J. Based on this experience, do you feel you can proceed intelligently in introducing automation in your library?

Yes 18 No 1

Comments:

K. How would you rate the technicality of the program?

1	Too technical
18	About right
0	Not technical enough

Comments:

L. Please rate the following aspects of the institute program:

	Very Helpful	Helpful	of Little Help
1. Programmed Course	8	8	2
2. Tour of Computing Center	8	6	5
3. Flowcharting	12	7	0
4. Programming Language	13	5	1

Comments:

L. continued	Very Helpful	Helpful	of Little Help
5. Group Problems	13	4	2
6. Automating Acquisitions	13	3	1
7. Automating Cataloging	8	8	1
8. Automating Circulation	9	6	2
9. Automating Serials	10	6	1
10. Industry Representatives		4	15
11. Computer Output Microfilmers	7	9	3
12. Informal Evenings Sessions	8	11	0

13. Special Comments:

EVALUATION - COMMENTS

I. ACCOMMODATIONS:

A. Housing Comments:

(1) Beds should be made every day and clean towels provided.
(2) Telephone preferred.
(3) Very good.

B. Meals comments:

(1) Best college food ever eaten.
(2) Excellent.
(3) Excellent.
(4) Consistently fine.
(5) Some of the best institutional food that I have ever eaten.
(6) For the price you can't beat it.

C. Classrooms comments:
   (1) More room to allow faculty members to circulate unrestricted to help participants.
   (2) A larger room would have been more acceptable.
   (3) A little overcrowded.

D. Recreation comments:
   (1) Enjoyed the ice cream social.
   (2) Good when we had time.
   (3) Thoroughly enjoyed the day at D'Arbonne.
   (4) Ruston is the same as always! But Forestry Camp #2 was great.

E. Computing Center Comments:
   (1) Very courteous personnel.
   (2) Several of the assistants very helpful and accommodating.

II. FACULTY:

A. Knowledge of material comments:
   (1) Faculty had thorough knowledge of their specialty.
   (2) Excellent.
   (3) Very knowledgable.
   (4) Excellent.

B. Formal Presentations comments:
   (1) Good, but not a learning process.
   (2) All presentations were not equally strong--for the most part I would rate the group "good".
   (3) Excellent.
   (4) Not very helpful, except programming (Gatlin).

C. Group Leadership comments:
   (1) Excellent.

D. General Helpfulness comments:
   (1) Hampered by the physical facilities; couldn't move about the room easily.
   (2) Excellent.
   (3) Couldn't have been better.
   (4) Very helpful and patient.

E. Informal Presentations comments:
   (1) These comments were extremely valuable.
   (2) Excellent.
   (3) Very valuable.

III. PROGRAM

A. General Impression comments:
   (1) Institute was very helpful.
   (2) Obviously favorable.

B. Where should we have spent More time?
   (1) On programming.
   (2) Rationale behind programming format.
   (3) Writing more programs with individual help.
   (4) Going over the basics of COBOL.
   (5) Flowcharting.
   (6) Group.
   (7) Group problems.
   (8) Elementary programming. Before I understood one concept of COBOL, we were off to another.
   (9) On own library ideas and possibilities.
   (10) Group work.
   (11) Flowcharts.
   (12) Individually working on a program.
   (13) In formal Cobol presentations--more leisurely explanation.
   (14) In group sessions.
   (15) Running more programs.
   (16) Correlating flowchart with writing programs.
   (17) Flowcharting and a little more on systems analysis.
   (18) Flowcharting; individual problems.

C. Where should we have spent less time?
   (1) Faculty presentations on their institutions.
   (2) I probably needed more.
   (3) The minute details of Cobol. These could have been better handled at the small group level.
   (4) It would have been difficult to cut any phases shorter.
   (5) Computer tours.
   (6) Formal presentations.
   (7) Being entertained by RCA.
   (8) On committee work where a greater knowledge of other areas would have been more helpful.
   (9) Formal presentations.
   (10) With vendors.
   (11) It seems that we didn't have enough time all the way around, so it is hard to decide where less time should have been spent.
   (12) No place, that I can think of.
   (13) Walking to and from the dining hall.
   (14) Actual programming.

D. Strongest part of the program:
   (1) Classroom presentations by faculty.
   (2) The faculty.
   (3) The demonstration of careful pre-planning and selection of faculty.
   (4) Low student/faculty ratio; intensive and well-coordinated instruction.
   (5) The programming section under Mr. Gatlin.

(6) The group sessions as it helped me understand the information.
(7) It is extremely difficult to say now but it was likely the Fla. Atlantic Acquis. Info Syst.
(8) Cobol Language lectures.
(9) Class sessions.
(10) The teaching and understanding of program principles.
(11) Strong and excellent faculty members.
(12) The faculty. Twas the greatest gathering of minds since Thomas Jefferson dined alone.
(13) Student programming.
(14) Programming.
(15) Group sections. (However, full class sessions were valuable)
(16) The small group instruction.
(17) Faculty.
(18) Exposure to the jargon and possible effectiveness of computer utilization.
(19) First three days.

E. Weakest part of the institute program:
(1) Last day of institute.
(2) Too speedy presentaticn of programming language.
(3) The computer company's representatives presentations. They were poor.
(4) Observed none.
(5) ?
(6) Manufacturers' Representatives Day. By the last day of the institute, they knew less than we did.
(7) Too much time in committee work without knowledge transmitted generally.
(8) The time in which we had to achieve what we did.
(9) No part of the program was weak.
(10) Mornings of second week.
(11) Vendor visits.
(12) All day listening to the computer industry salesmen.
(13) The computer industry representatives.
(14) Amount of time allotted for the amount of material to be mastered.
(15) I am not sure about the length and amount of material covered. Could it have been longer and not such an intense pace. But no doubt, it would have lost some of its force, and that was good.
(16) The time could have been expanded to 2 1/2 weeks.

F. Has the institute been worth your time, expense, and effort?
(1) The institute was well worth everything.
(2) Definitely!
(3) Worked hard, considered result beneficial.
(4) Yes, I would repeat the institute, if possible.
(5) I feel I have gained in knowledge and ability and will therefore be able to communicate with my computer center.

(6) I think I am just about ready for the beginning of a program.

G. As a result of this institute, do you feel more confident about your ability to use electronic computers in your library?
   (1) More confident, but plan to continue studying.
   (2) Already confident.
   (3) I feel that I can now discuss library problems with the computer center personnel as I understand their terms and language.
   (4) I feel that now I am able to take a formal course in computer science or program language.

H. Did you complete the programmed learning course prior to your arrival on campus? Comments:
   (1) The books were well chosen, but I simply did not allow myself enough time to finish the second book.
   (2) End of fiscal year business and library work load preliminary to a three-week absence made this impossible.
   (3) A very cursory examination of the text.
   (4) It wasn't of great help.
   (5) Old excuse: didn't have time.
   (6) Thoroughly.
   (7) But merely rushed through due to busy schedule.
   (8) The second volume was too much.
   (9) Much too technical to complete!

I. Was the institute program practical enough? Comments:
   (1) As a whole it was, but there were a couple of weak spots.
   (2) Although some concepts were covered that most of us will never have use for.
   (3) Not quite.
   (4) Decidedly!!
   (5) Although I would have liked to have discussed my individual problems more with the faculty.

J. Based on this experience, do you feel that you can proceed intelligently in introducing automation in your library? Comments:
   (1) If I cannot, it is not the fault of those giving the Institute.
   (2) I will still need some advice.
   (3) With some help.
   (4) Already done.
   (5) I will seek advice.
   (6) With the help of the computer personnel.
   (7) Only after further efforts at familiarizing myself with the subject.

K. How would you rate the technicality of the program? Comments:
   (1) I am well pleased and surprised at the amount of general knowledge assimilated.
   (2) More time to grasp concepts of programming.
   (3) Not too technical for purposes of the institute, but too technical for amount of time available.

L. Rating of different aspects of the institute program. Comments:

2. Tour of Computing Center
   (1) A more thorough explanation of the hardware would have been helpful.
   (2) Hurried--he wanted us out of there.
3. Flowcharting
   (1) Decision table construction lacking. They <u>are</u> helpful.
5. Group Problems
   (1) Our problems should have been more clearly designed.
   (2) More time needed.
6. Automating Acquisitions
   (1) Hit the nail on the head, very useful.
10. Industry Representatives
   (1) Industry representatives presentations were of use in the sense that they gave us an opportunity to make some evaluation of the salesman's credibility.
   (2) Of little help, though, as Bruce said, it was a good lesson in what to expect of salesmen.
   (3) Value of representative's presentations, nil; as specimens of <u>caveat emptor,</u> interesting and valuable.
   (4) I would have liked to have been given written information about their products and possibly have seen the actual equipment.
12. Informal Evening Sessions
   (1) The evening sessions would have been more helpful to me if they had been operated as individual tutorial sessions rather than as a group.
   (2) These sessions good not only for computer discussion, but general library discussions.
13. Special Comments:
   (1) This institute showed what can be done by those who plan carefully beforehand what is to be done, and by a group who are truly interested in the program. It was interesting to see the diversity of the participants as to age and interest in various aspects of library work. If all institutes were like this one, the educational world would be better off.
   The pace of the institute was rapid, and perhaps hard, but it was a good work-out.
   (2) A very well organized institute, well planned to the smallest detail. The director's kindness and attention was way beyond the call of duty. In one word--excellent.

(3) I think the institute was well planned, all details had been taken care of, the faculty were dedicated and could take all of our problems without losing their sense of humor. I learned a lot from the institute that will help me in my future plans in library work. The Director and faculty are to be congratulated for an outstanding job.

Enjoyed it and profited from it--You are always second-guessed concerning the content of a short program.

(4) I came to this institute with the feeling that I might be able to follow what was being discussed to some degree but I never expected to acquire as much information of a general nature which promises to be of great help in working with computer personnel.

I would have liked to have been able to attend two of the group studies but of course this wasn't possible.

(5) Intelligent, hard-working, knowledgable, congenial faculty--and myself excluded, would say that students were congenial, cooperative, helpful, intelligent, interested.

Faculty provided sound leadership.

(6) The institute was extremely valuable for me. (I would regroup ones with prior training and formal classes in one group so slow learners could take more time.)

Well organized.

(7) The crowded classroom was a problem. The instructors were unable to move freely about the room.

I did not expect to learn to program but I feel that I accomplished a good deal.

All in all, I feel the institute was well planned and very helpful.

(8) More interest has been created to use automation in a library system.

(9) For the most part, the institute was an extremely worthwhile experience for this participant.

(10) The institute was extremely helpful for me, and I feel that my time and money has been well spent. So many institutes of this type turn into social occasions only, but I must say that this has not been the case here. It is always a pleasure to work in order to attain this goal.

(11) Too much attempted in too little time, but all of it well worth doing and learning.

Extreme variation in various capabilities and effectiveness of of the instructors.

End of June is a bad time to schedule an institute such as this.

All other comments which could be made would be very, very favorable. An excellent institute.

(12) In the interest of women's liberation--and other things--I think there should have been a more equitable proportion of women to men, particularly young women.

(13) All things considered, an excellent institute.

(14) A longer lunch hour with time to nap would have helped.

(15) Begin institute; Open ideas; Don't stop.

APPENDIX F

COMPUTER INDUSTRY REPRESENTATIVE'S SCHEDULE

Friday, June 26, 1970

8:00 - 9:00	General Electric, Mr. John Linden
9:00 - 10:00	International Business Machines, Mr. Hines Vaughn
10:00 - 11:00	Honeywell, Mr. Kenneth Inman
11:00 - 12:00	National Cash Register, Mr. Tom Brown
12:00 - 1:00	Lunch
1:00 - 3:00	Computer Output Microfilmer, Mr. Bruce Alper and Mr. John Kennedy
3:00 - 4:00	Radio Corporation of America, Mr. Richard R. Knauf and Mr. W. Richard Moore
4:00 - 5:00	Xerox Data Systems, Mr. William E. Cartwright